

Water Quality Temperature Criteria Guidance

Collected Comments

(Comments submitted from
October 10 to November 26, 2002)

Part I – Agriculture and Water Use,
Forestry/Pulp/Paper, Industry and
Hydroelectric Interests

U.S. Environmental Protection Agency
Region 10 – Pacific Northwest

December 2002

Agriculture and Water Use Comments



IDAHO FARM BUREAU FEDERATION

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November 26, 2002

Mr. John Palmer
EPA Region 10
Mailstop: OW-134
1200 S.W. 6th Avenue
Seattle, WA 98101

Re: Review of the Second Draft EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards

Dear Mr. Palmer:

The Idaho Farm Bureau Federation (IFBF), representing 56,000 member Idaho families, appreciates the opportunity to comment on the draft guidance for temperature water quality standards. While IFBF believes the second draft Regional Water Temperature Guidance is an improvement over previous drafts, we are concerned that some of the criteria for this guidance is being based on disturbing assumptions.

As you already know Idaho has a high mountain desert climate with varied terrain and temperatures. We disagree with the assumption that colder is always better for aquatic life, especially in the summer. IFBF has information from Idaho Fish and Game indicating that fish populations exist in streams that may never meet these temperature guidance criteria. We disagree with EPA with regard to protecting water colder than criteria. This appears to be treating the symptoms, not preventing the problem.

We also raise the question of sediment control. Is it not more important to control sediment than temperature? We are concerned that, if this draft is adopted, EPA may have two conflicting policies - one on temperature and one on sediment. This would create confusion among Idaho's irrigators. Which policy would EPA deem more important: reduction of sediment or temperature control? If this temperature criteria stresses colder is better, then you may no longer see investments in sediment ponds or constructed wetlands from Idaho's irrigation community.

Many irrigation companies and farmers have spent considerable amounts of time and

millions of dollars installing sediment control structures or constructed wetlands systems next to many of Idaho's rivers and streams. In the middle Snake River alone over \$2.2 million dollars has been spent over the last five years to reduce sediment coming back to the Snake River. These structures are constructed to slow the water velocity which create a larger surface area to allow sediment to be captured, but they absorb and reflect the radiant heat during the summer months and thus warm the water.

Last year the farmers in Twin Falls County spent over \$400,000 converting surface irrigation systems near the river to sprinkler to prevent surface runoff from going back into the Snake River. The lack of return water could cause the river temperature to rise more because these return flows constitutes a modest percentage and thus make it easier for ambient temperatures to affect the river.

IFBF does not believe the present draft takes into account the laws of thermodynamics when setting a temperature criteria for streams in the region. Stream temperature will be affected by heat transfer and the ambient air temperature.

If you base the temperature guidelines on assumptions that colder is better and discount the laws of thermal dynamics, then the temperature criteria or numerical number will be neither correct nor attainable for many of the reaches in Idaho streams and rivers.

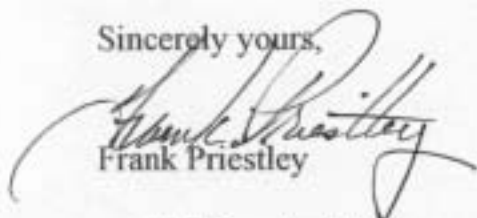
Adopting the criteria now outlined in this guidance may trigger the necessity of developing and implementing many total maximum daily loads (TMDL)s on many streams and rivers at great financial costs to states, watershed advisory groups, and affected landowners with no hope for success because of an EPA derived numeric standard. Under this draft, the only alternative for a state to avoid an expensive TMDL is to conduct an expensive "Use Attainability Analysis". EPA has not had much luck or time in approving such an analysis.

IFBF supports temperature guidance that recognizes the roles and authority that states possess in formulating water quality standards. EPA should not preempt opportunities for states to construct water temperature standards that deviate from EPA's recommendations. The standards must be grounded in local knowledge and defensible science. We also believe EPA should not add guidelines and provisions which increase the complexity of the document and reduce the flexibility for states' implementation

We applaud EPA for allowing natural conditions. It is important to recognize that all temperature is not man-made. It mostly stems from natural occurrences. Natural heat loads and stream temperature vary widely. Only added heat should be considered a pollutant to be corrected. High temperatures alone are not an indication of added heat. Man may not be able to impact some of the causes of high temperatures or other water conditions.

Because of these concerns, IFBF asks that EPA suspend the current document and create a more open process. The process should include input from affected stakeholders on both private and public land as well as water management entities such as counties, cities, utilities, agriculture, businesses, industries and others who have a stake in the outcome.

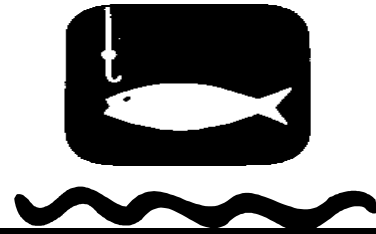
Sincerely yours,

A handwritten signature in black ink, appearing to read "Frank Priestley", is written over the typed name. The signature is fluid and cursive, with a large initial "F" and "P".

Frank Priestley

cc: U.S. Senator Craig
U.S. Senator Crapo
U.S. Representative Simpson
U.S. Representative Otter
Governor Kempthorne,
Lt. Governor Riggs
State Senator Noh
State Representative Bert Stevenson
State Senator Bob Geddes
State Representative Bruce Newcomb
Mr. Jim Caswell
Mr. David Mabe
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Idaho United for Fish and Water



November 26, 2002

John Palmer
EPA Region 10
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palmer.john@epa.gov

**RE: Draft EPA Region 10 Guidance for Pacific Northwest State and Tribal
Temperature Water Quality Standards**

Idaho United for Fish and Water is a coalition of 17 groups in Idaho whose mission is to help preserve and restore Idaho's water resources and its anadromous fish runs and to protect Idaho's economic health.

We are grateful for the opportunity to submit these comments concerning the October 10, 2002 Second Public Review Draft Environmental Protection Agency Region Ten Guidance for Temperature Water Quality Standards.

Simply put, these standards are not achievable. In fact, Idaho's current standards are below naturally-occurring temperatures, and the standards proposed are even worse. In addition, science exists that demonstrates that such parameters are not needed and, indeed, could even be harmful to the fish. Such unrealistic and impossible standards will simply guarantee that water users will not make a serious attempt to achieve them, knowing that such expenditures of effort and money will be wasted. In addition, attempts to meet the standards run the risk of conflicting with other water quality efforts, such as the use of sediment ponds which can further warm the water.

We also believe that standards designed to protect salmonid species should not be applied in waters that host no such species. Applying them simply requires users to expend time and money on activities which are predestined to be fruitless.

There is also the question of the State's sovereignty over its waters. The Idaho Department of Environmental Quality has submitted a report pointing out significant and consequential errors in EPA's technical issue papers. The standards should not be finalized until these issues are resolved. This begs the question of where, in the Clean Water Act, Congress stated its intention that EPA should impose such standards upon the states in the first place. We cannot find any such language in the legislation.

The draft also continues to ignore the impact of ground water recharge as a result of irrigation. That recharge increases the capacity of the river and, consequently, can significantly

lower temperatures. And, contrary to the document, there is no evidence that dams reduce river flows – in fact, there is evidence to support the statement that, over the past century, river flows have actually increased in the system.

Idaho has a warmer climate – and naturally warmer waters – than EPA gives it credit for. Much of the Snake/Columbia system flows through unshaded semi-desert. Salmonids have been shown to be very highly adaptable and clearly have thrived for decades in the system's naturally warm water.

It is our position that EPA should withdraw this second draft, admit that these issues are beyond its purview and allow the states to deal appropriately with them.

Sincerely,

A handwritten signature in cursive script, appearing to read "John Barclay".

John Barclay
Coordinator



Idaho Water Users Association, Inc.

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November 26, 2002

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John Palmer
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Re: Draft EPA Region 10 Guidance for Pacific Northwest State and Tribal
Temperature Water Quality Standards

Dear Mr. Palmer:

These comments are submitted on behalf of the Idaho Water Users Association, Inc. ("IWUA"), regarding the October 10, 2002, 2nd Public Review Draft Environmental Protection Agency ("EPA") Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards ("2nd Draft Temperature Guidance" or "Guidance").

IWUA is an Idaho non-profit corporation, representing approximately 300 irrigation districts, canal companies, water districts, public water suppliers, municipalities, hydropower interests, aquaculture companies, agri-businesses, professional firms and individuals, all committed to the wise and efficient use of our water resources. IWUA maintains a standing committee on water quality and is actively engaged in water quality matters on behalf of its membership, including the development and implementation of Total Maximum Daily Loads ("TMDLs"). We appreciate the opportunity to provide these comments.

As an initial matter, we believe the public comment period that has been provided on the 2nd Draft Temperature Guidance is too short and that additional time, up to 90 days, should be provided beyond the current November 26, 2002 deadline.

The initial Draft Temperature Guidance released by EPA during 2002 was unworkable. Unfortunately, so is the 2nd Draft. The October, 2001 Draft Temperature Guidance suggested unrealistic temperature standards. These were standards that cannot be met throughout most of the Pacific Northwest and certainly cannot be met in the desert climates of Idaho. After 700 public comments, many information meetings and hearings, and even a resolution by the Idaho State Legislature, EPA issued the 2nd Draft Temperature Guidance a year later (October 10, 2002) with temperature standards which still cannot be met.

EPA's cookie-cutter approach -- its one-size-fits-all guidance -- simply will not work. The temperature standards that Idaho has in place are already unachievable in many instances. EPA's draft guidance would only make a difficult situation even worse.

Water users in Idaho have taken on the TMDL challenge for sediments, nutrients, and a number of other pollutants. In particular, there has been significant participation by irrigation entities in voluntary efforts to address real water quality problems over the past decade.

In large part, this "buy-in" and resulting participation by water users has been the result of a "can-do" attitude and a sincere belief that the efforts being undertaken will make a real difference to improve water quality where it is actually needed.

The 2nd Draft Temperature Guidance will do nothing to engage water users. Knowing that the standards are unrealistic and that they cannot be achieved, there will not be any serious attempt to meet these standards. In fact, they will hamper current TMDL efforts. Water users have implemented approved Best Management Practices ("BMPs"), including the construction of sediment ponds and wetlands to treat pollutants. These activities work very well to remove pollutants before irrigation return flows enter the river. However, by slowing or collecting water, they do not lower the water temperature. Rather, they raise the water temperature. Is it EPA's desire that water users refrain from implementing these proven BMPs? It is certainly not possible to implement these BMPs and, at the same time, attempt to meet EPA's proposed water temperature criteria.

In addition to our general concern about the impracticality of the 2nd Draft Temperature Guidance, we have the following specific concerns about the document.

1. The Criteria Should not Apply in Unoccupied and Upstream Areas. In the Introduction section, on page 1, the Guidance states: "Standards for temperature . . . will protect cold water salmonid species". The Guidance needs to make clear that there is absolutely no need to meet these standards in waters which do not contain these cold water salmonid species. As a result, the statements appearing on pages 19, 20 and 28, regarding the application of the criteria upstream and in areas where there is potential to restore temperatures, should be removed or modified.

2. States Should Not be Required to Adopt the Criteria. The Guidance states that it "does not preclude States or Tribes from adopting temperature WQS different than those described here. . .where EPA determined that its approval would be consistent with the CWA and ESA." Guidance, p. 1. This decision will also hinge on "whether the State or Tribe demonstrates that the criterion protects designated uses". Guidance, p. 3. Site-specific criteria are also possible, but "[t]he State or Tribe would need to describe how the site-specific numeric criterion fully supports the use". Guidance, p. 29. It is apparent that the burden rests heavily on the respective States to justify any departure from the criteria and that the final determination will always be EPA's to make. Some of the showings will be virtually impossible to make. Others will require agreement among numerous federal agencies, which do not always agree with one another. This provides virtually no assurance that the States will actually be allowed to adopt their own temperature standards. The approaches that are suggested by EPA, including site-specific criteria, consideration of natural background conditions, and use attainability analyses, are all complicated, time-consuming and expensive. Engaging in these types of efforts, solely

for the purpose of escaping from temperature criteria that are totally unrealistic and unachievable, will consume resources that are better spent on the current TMDL program and other efforts to deal with real water quality problems. The Guidance should be revised to provide greater flexibility to the States and less scrutiny by EPA and the other federal agencies.

3. EPA Has Not Adequately Addressed the Technical Issues. When reviewing State standards or promulgating federal temperature water quality standards, "EPA will use the most recent scientific information on temperature tolerances." We are aware that Idaho's Department of Environmental Quality does not agree with EPA's technical issue papers and has submitted a minority report. Yet, EPA has apparently decided to move forward with this highly questionable approach for the entire Pacific Northwest Region. To the extent that the technical issues raised in the minority report, and other remaining technical issues, have not been adequately addressed, it is inappropriate to finalize the Guidance.

4. The ESA is being Improperly Used as Leverage Against the States. We applaud EPA's recognition that the Endangered Species Act does not expand EPA's authorities under the Clean Water Act. However, this does not eliminate our concern that the ESA is being improperly used as leverage, through the CWA, to force adoption of EPA's Guidance by the States. We continue to question this linkage between the two federal laws and urge EPA to give this issue additional consideration.

5. The Guidance includes Inaccurate Generalizations about Human Impacts, Including Water Withdrawals and Storage. The description of human impacts in the Guidance only discusses generalized, negative impacts, many of which are inaccurate or incomplete. With regard to water withdrawals from the rivers, the Guidance fails to acknowledge or account for the impacts of ground water recharge resulting from irrigation. This recharge increases spring flows, thereby moderating the temperature in the river and increasing the quantity of water flowing in the lower reaches of the river. Also, the Guidance alleges that dams significantly reduce river flow. However, the facts indicate that current summer flows at Lower Granite Dam are actually higher than they were 85 years ago. This is because water is stored behind upstream dams in the winter and spring and is released in the summer, providing more water in the summer months. These two examples demonstrate the problem of making generalizations and trying to impose a one-size-fits-all approach on the entire region.

6. EPA has no Authority to Impose Cold Water Protections or ORWs on the State of Idaho. EPA's proposal to adopt regulatory provisions to protect existing water temperatures that are colder than numeric criteria is without any basis in the Clean Water Act. No matter how many drafts EPA puts this suggestion in, the fact remains that there is no authority to require this. The proposed "no impact" standard only applies to Outstanding Resource Waters ("ORWs"), not all waters. In our view, this is a backdoor attempt to establish ORWs in the State of Idaho, in direction contradiction to our State Legislature's refusal to make such designations. Similarly misguided is EPA's call for "strong regulatory measures to protect waters that are currently colder than EPA's recommended criteria". If ORW designations are to be made, they must be made by the State of Idaho, not through EPA's Guidance.

7. It is not "Unusual" to have Warm Conditions in Idaho. The Guidance attempts to recognize conditions under which the criteria cannot be met under "unusually warm conditions". The problem is that it is not "unusual" to have warm conditions in many parts of Idaho. That is

the norm, as reflected by water temperatures. Air temperature and water temperature are directly linked. Warmth is not an "infrequent condition" in Idaho. It doesn't happen only 1 out of 10 years. It can happen in multiple, often consecutive years. As a result, this section is completely unworkable, as is the remainder of the Guidance.

For these reasons, we request that EPA withdraw its 2nd Draft Temperature Guidance, as it did with the original draft, and leave the temperature issues for the States to grapple with. IWUA members already have enough difficulties in meeting current State temperature standards.

Once again, thank you for the opportunity to provide these comments.

Sincerely,

A handwritten signature in black ink, appearing to read "N. M. Semanko", is displayed on a light blue background.

Norman M. Semanko
Executive Director & General Counsel

NMS:p

cc: Governor Dirk Kempthorne
Idaho Department of Environmental Quality
Idaho Office of Species Conservation
Idaho Congressional Delegation
Idaho Legislative Leadership and Committee Chairs
IWUA Board of Directors and Water Quality Committee

Oregon Cattlemen's Association
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John Palmer
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Oregon Cattlemen's Association has reviewed the second draft of the EPA Temperature Guidance Document. We have not changed our mind since the first draft and believe the Guidance fails to address temperature and continues to read as an essay about fish. We suggest it be revised and rewritten and have submitted copies of the literature you will need to begin to address the water temperature issue.

A Request for Information, April 2000 was made and a number of papers were submitted to EPA for use. They were mostly ignored. We are attaching a list of references about water and water temperature that should be included in the temperature guidance and have shipped a notebook to be attached to our comments. The scientific literature provided as part of this review is missing from the EPA work. We are sending copies of the published works to be used in further revision of the guidance document.

The draft Guidance contains attempts to summarize a variety of concepts found in many popular journals, texts, etc. We recommend providing a literature review of "appeals to authority" that are objective studies that demonstrate an application of science principles. EPA should avoid using narratives that are mere "opinions and speculations" about how links might be made between water temperature and fish behavior in the water. An effort to substitute speculative statements for gaps in the EPA's knowledge about science are obvious. We further suggest the following:

1. Write Guidance to encourage State and authorized Tribes to show a tie between any identified problem and the measures identified to control a temperature problem. The Guidance documents lacks any specific direction about problems that have been verified in the 3 states. If problems exist, the Guidance should indicate steps States and Tribes can take to identify them and cause some prioritization of the the work to be done. There is no guidance for this as currently written.
2. Natural or background conditions and unusual events need to addressed. Both items play a large role in the conditions of the water. Provide guidance to identify the role and provide the science that governs water temperature increases and decreases. The EPA Guidance suggests that standards can be the governing factor. EPA Guidance should not allow the first step to be an assumption that thermal pollution exists everywhere. This needs to be clearly addressed from the perspective of the natural heating of water according the the heating principles described in Physics textbooks.
3. EPA's Guidance implies that WQ Standards can be based on maybe, potential, or speculative causes. This is unrealistic. The State and Tribal enforcement must be based on factual evidence and the EPA's Guidance has not cited credible evidence that water temperature increases can be controlled by setting a standard based on a life cycle of fish.

The guidance must return a product that meets the needs of the citizen's of the region. This point has not been discussed in the Guidance. The Guidance should be based on factual evidence and EPA has missed that mark. There are too many assumptions in the document and Issue Papers often lacking literature citations for several pages that support the narratives. We are unwilling to accept it as representing the best scientific knowledge available.

Sincerely,

Pat Larson
Science and Natural Resource Advisor
Vice-Chair, Water Committee

Susan Hammond
Chair, Water Committee

Copy: Robert Skinner, President Oregon Cattlemen's Association
Glen Stonebrink, Executive Vice-President
Coy Cowert, President-Elect

COMMENTS:

The "guidance" does not describe the steps States and authorized Tribes should take to establish temperature standards. Instead the guidance presents an agency view of how the CWA and ESA can be linked both scientifically and legally.

We do not agree with the merge of the two laws and suggest that a different route be taken by EPA so that States and authorized Tribes can set temperatures standards that are scientifically defensible, workable at a State level as well as a local, site specific measurable parameter.

The guidance makes no distinction between temperature issues related to point sources and those associated with non point sources. The guidance indicates that all standards should be stated due to non point contributions and we feel the task is incomplete until this is further clarified.

COMMENTS about Regulatory aspects:

TITLE 33 : CHAPTER 26 : SUBCHAPTER III : Sec. 1314. Sec. 1314 states that the Administrator, after consultation with appropriate Federal and State agencies and other interested persons, shall develop and publish, within one year after October 18, 1972 (and from time to time thereafter revise) criteria for water quality accurately reflecting the latest scientific knowledge.

Section 7(a)(2) of the ESA requires biological opinions to be based on "the best scientific and commercial data available."

The CWA goal is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters and where attainable, to achieve water quality which provides for the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water. It is the EPA's role to manage and implement the federal programs that enable States and authorized Tribes to meet the goal. EPA's approval of state water quality standards is not dependent on the "biological opinions" issued under the ESA, but must be done using criteria for water quality that accurately reflects the latest scientific knowledge.

It is under the National MOA that EPA allows NMFS and USFWS opportunity to comment on the standards submitted by the States and Tribes. The comments do not become a part of ESA implementation and therefore also take on CWA authority. The "opinions" issued by the Services are put forth only as opinion and there is nothing that mandates or insists that the "opinions" and comments be from "the latest scientific knowledge. The CWA mandate to EPA doesn't change. EPA must base its guidance to meet the goals of the law which are to maintain the

integrity of the Nation's water and achieve water quality for propagation of fish etc. EPA's nose must be in the water or on the water and not everywhere else.

Of utmost importance to EPA is its "adherence to" and "honor of" the States rights in addressing individual state policies. The States identify the beneficial uses of the State waters and their resources available to them to prevent water pollution.

The Region 10 effort to set apart the Oregon, Idaho, and Washington temperature standards from the rest of the United States under the auspices of both the CWA scientific knowledge and ESA "best scientific and commercial data available" by issuing Technical Papers with the guidance, stretches our imagination. One law expresses the National goal for clean water, another expresses the Nation's desire to protect endangered living organisms, and EPA is suggesting that science has made a link between the two, and that the Region 10 EPA Guidance has found a way to balance the U.S. federal laws with Nature's Laws. We suspect there is an error in EPA's calculation of the physical laws matching the criteria set forth in the CWA and ESA laws.

The Guidance does not contain much at all about Nature's Laws and the Guidance must be rewritten to reflect both fish physiological responses to water as well as the physical limitations of river and stream water to respond to human interventions.

EPA develops its section 304(a) criteria recommendations based on a uniform methodology that takes into account a range of species' sensitivities to pollutant loadings using certain general assumptions; therefore, the national recommendations are generally protective of aquatic life. However, these criteria recommendations may not be protective of all aquatic life designated uses in all situations.

COMMENT: It may appear to EPA that aquatic life is protected by the temperature standard criteria but unless and until you examine whether streams can be made to cool or warm according to your criteria, you are merely regulating a wish. The perspective is entirely too narrow. The CWA discusses temperature changes in surface waters that could be impacted by industrial discharges, but they do not take into account how water temperatures are affected for non point source contributions. The two are not the same and changing water temperatures under each type of contribution are very different matters.

EPA: *(We) added more information about human-elevated water temperatures as a factor in salmonid decline;*

COMMENT: We have submitted as part of this record a number of publications that enlightens us regarding the "human" element in temperatures affecting salmonid decline. The scientific information used by EPA is strictly fish biology. It is not enough.

Attached to these comments are selected science publications for EPA to review and include into the temperature guidance for states and tribes. We believe you must turn the theory around and show that it is ubiquitous to many situations.

1. As explained in the guidance document stream temperatures can be influenced by factors that directly linked to fish needs. If this is true then you must provide science to support this theory. Fish literature discussing fish behavior under lab conditions or explaining their physiological response to stressors is not sufficient to address the theory you are promoting.

2. You must provide science that proves that fish mortality is higher in streams with low vegetation

cover when compared to streams with dense vegetative cover.

3. The EPA theory and guidance document suggest that a fish response to a stress means the river and stream temperatures can in fact be changed by land activities. We note that EPA has not found a demonstration area where the theory has been put into practice.

4. In Figure 1 we submit evidence that the EPA guidance is off target. The water temperatures at these two sites occur with shade (canopy site) and no shade (sagebrush site). The water temperatures were measured on the same day, same year, and the pattern is repeated over several years. You have missed establishing an important element in your theory. A good theory is ubiquitous and is applicable in many places under many circumstances.

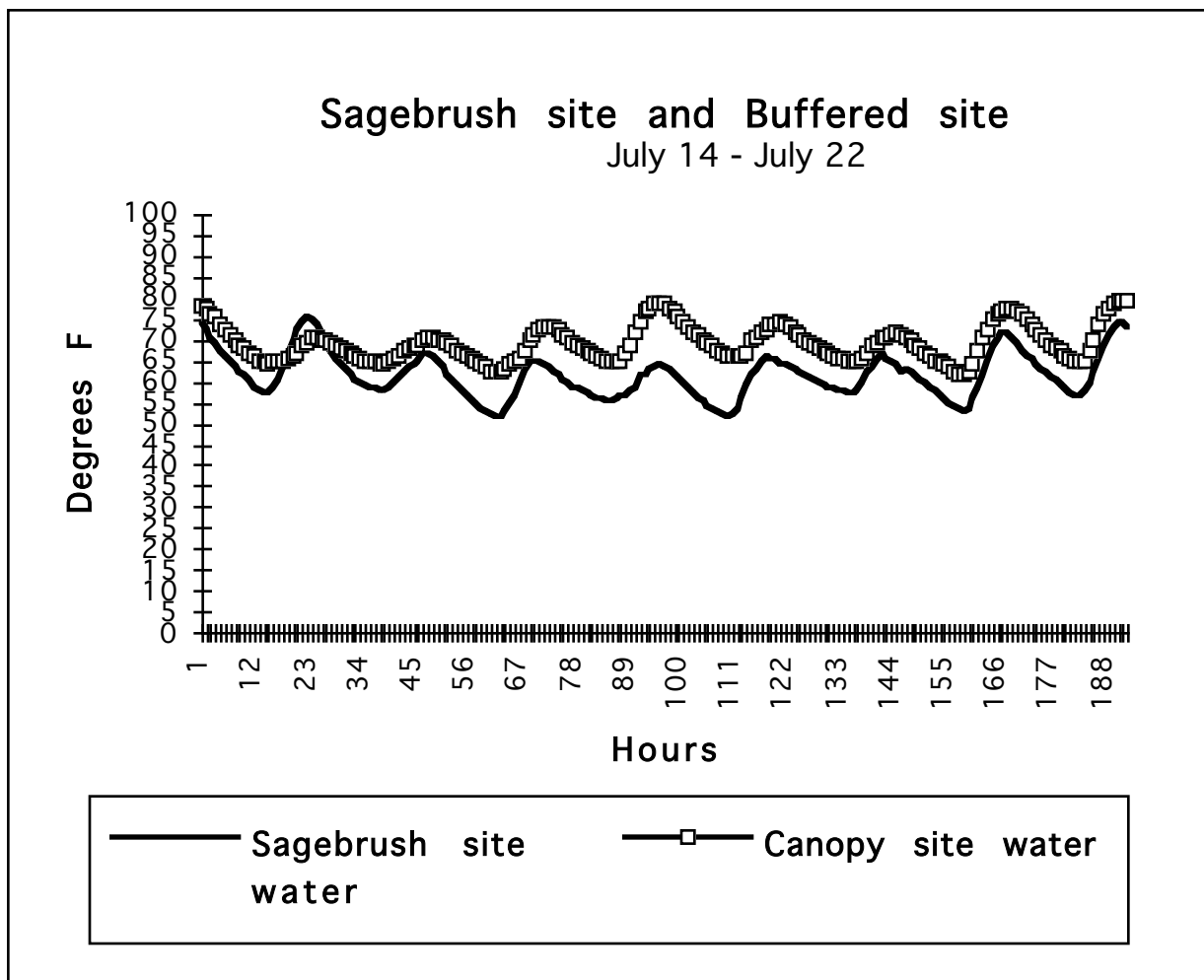


Figure 1. We have compared a stream with a sagebrush riparian buffer to an Oregon stream on the west side with approximately 80% canopy cover. Under these extreme canopy differences we found the sagebrush stream to be cooler than the canopied western Oregon stream. The event was examined over two years and similar results occurred during both years. The data was consistent with physical laws (Kirkpatrick and Wheeler, 1984). A discriminant analysis and analysis of variance (Sneeden and Cochran, 1964) indicated that the rates of heating and cooling on both streams were consistent with elevational thermal gradients described in atmospheric physics.

5. We do notice though that in warm water streams salmonids are often replaced by other aquatic life effective in occupying the same niche. The integrity of the environment is not compromised by other species. It's a part of the natural system.

In streams where the temperatures are within the acceptable range for Salmonids, the species is present during the life stages that are adaptable to the stream temperature cycle. The EPA guidance does not recognize whether salmonids should be in every stream. EPA has not satisfied the question that salmonids are a rare exception to life on earth rather than similar to other biological populations of mammals, reptiles, amphibians, and plants that have evolved in habitats suitable to their physiology. It is a far reach to suspect that salmonids are an exception. This must be addressed.

***EPA:** Based on extensive review of the most recent scientific studies, EPA Region 10 and the Services have concluded that there are a variety of chronic and sub-lethal effects that are likely to occur to Pacific Northwest salmonid species exposed to the maximum weekly average temperatures calculated using the current 304(a) recommended formulas.*

COMMENT: EPA has made an error in reviewing the literature intended to support the guidance regarding thermal cycles in the Pacific Northwest. CWA as stated before mandates criteria for water quality accurately reflecting the latest scientific knowledge.

'Science' means the systematic enterprise of gathering knowledge about the universe and organizing and condensing that knowledge into testable laws and theories.

Fundamental science, is generally (there are exceptions) not interested in how a specific system behaves. Rather, the goal of science is to discover the fundamental laws of Nature, which means we are interested in finding that few set of rules that apply to all objects and systems in the Universe.

A scientist who writes an article or publishes an article may or may not be reporting scientific information, but may be speculating about how various components of science could be linked. Biological events are rarely captured in short essays with any meaningful evidence of their validity within the body of science. EPA relies heavily on this type of information.

Scientists and nonscientists bear the burden of identifying the type of articles where information is found when researching a topic. They also must scrutinize articles to determine if the idea has presented more complete or reliable evidence than a current theory on the topic.

Computer modeling is not science. The model is a hypothesized process and its predictions of the stated variables are the test consequences. The model is an informed guess, a mixture of knowledge and error about a process of nature. Models are often tuned or calibrated, a process in which some of the model parameters are "fiddled with" to force better agreement between predicted and observed consequences. This serves as feedback for what is called model validation which is not the modeler's ability to hypothesize but rather an ability to fiddle. We do not agree that "fiddling" with numbers is sound guidance to determine standards.

A recommendation we offer regarding "thermal pollution" for streams is to recognize areas based on geographic and ecological regions as described in current literature to guide the states in setting standards to account for the variability among streams located in different topographic and climate areas. It should be obvious that streams located in Eastern Oregon are first affected differently than those in Western Oregon due to physical location. The natural and expected thermal cycle of stream defined by its geographic location, topographic location above sea level, and seasonal

climatic variations due to local land mass influences.

Human impact on streams will never make sense to the agency or States and Tribes until that element is first established before the standards are set. EPA's narrative on human impacts to stream temperatures was not supported in the literature used to write the document. We have submitted copies of the literature to be used on this topic.

We suggest establishing the 303(d) listings based on these factors. The 303(d) list has been examined by the National Academy of Science and they have made suggestions that EPA make a 303(d) list based on a tiered system. The suggestion is worthy of examination by Region 10 in providing guidance to set standards that make sense and will allow for some confidence in assessing the quality of the State's waters.

We expect a standard to be an objective determination and not a subjective "fiddling" nightmare which it has become in Oregon. We also notice that once the "fiddling" begins, no off ramp is available. The Oregon TMDLs are being written based on how much shade ODEQ calculates is needed on stream reaches to block the "pollutant" sunshine. TMDLs are being written for entire watersheds and the leadership at EPA has been absent. TMDLs are being written from the court rooms, not the watersheds and we think it would be best to have EPA refrain from interfering further without a National Guidance in place. The "scientific information" has been questioned at the National level by the National Academy Report (2001) and Region 10 should become familiar with that information before it moves forward with this Guidance Document.

Nothing in the literature or discussions address the physical and chemical components of water. Scientists have used water throughout the centuries to conduct experiments. The Guidance document is one sided.

Thermodynamics states that: if three or more systems are in thermal contact with each other and all in equilibrium together, then any two taken separately are in equilibrium with one another (Bohren 1998). Thermometers are based in the laws of Thermodynamics and humans are not reliable thermometers (Bohren 1998). The laws establish the principles of using a thermometer to indicate the quantity of accumulated energy in a substance and imply the irreversibility of certain processes. These concepts of temperature explain how heat (thermal energy) flows from one body to another. When two different materials are brought into thermal contact with each other, they reach thermal equilibrium, but do not experience the same changes in temperature because of their different specific heats and masses. The heat lost by the hotter object is equal to the heat gained by the colder object (Kirkpatrick, and Wheeler, 1995). Heat and temperature are not the same. Heat is energy that flows between a system and its environment by virtue of a temperature difference that exists between them .

COMMENT: We suggest the following: Recognize areas based on geographic and ecological regions. Establish the 303(d) listings based on these factors. Determine water quality limited stream listings by identifying which part of the 303(d) list they should be put on due to their physical location which is affected by elevation and climatic events.

We also recommend that EPA become familiar with the following atmospheric event:

Lapse Rate

Essentially, the lapse rate is a measure of how much air decreases in temperature as it rises through the atmosphere.

Environmental Lapse Rate : (ELR)

This is the actual measured decrease in temperature with height above the ground (i.e. the rate which is actually occurring, not a theoretical rate).

Generally this is about 6.5 C per 1000 m. This rate does vary and depends on local air conditions. There are several influencing factors:

- * Height: Lapse rates depend on ground temperature (and are normally less near the ground)
- * Time of Year: Lapse rates are lower in winter or during a rainy season.
- * Surface: Lapse rates are lower over land than sea.
- * Air masses: Different properties of air masses mean different lapse rates.

Adiabatic Lapse Rate :

This is a theoretical rate and can be calculated.

Looking at Dry Adiabatic Lapse Rate : (DALR)

A dry parcel of air which does not mix at all with the surrounding air is considered. As this parcel does not mix it can be considered to be adiabatic (i.e. it does not lose any heat outside of the parcel in the process). As the parcel of air rises through the atmosphere the surrounding pressure is less and so the parcel expands. Expanding takes energy and so the parcel cools (i.e. heat energy used in expansion). The rate at which the parcel cools, the DALR (dry adiabatic lapse rate), stays constant at 9.8 c per 1000m.

The dry adiabatic lapse rate only applies when the relative humidity is less than 1000%. When the air cools to dew point (the temperature at which the air can hold no more water without condensing) water vapor condenses out leading to complications due to the energy introduced from the latent heat. This then means that the saturated lapse rate is used below this temperature.

Looking at Saturated Adiabatic Lapse Rate (SALR)

The saturated lapse rate has to take into account the fact the energy is released when water condenses (called the latent heat). This means that once the air has cooled to the dew point and water has started condensing the air parcel cools more slowly. The SALR (saturated adiabatic lapse rate) range from 4 C per 1000m to as high as 9 C per 1000m. The average SALR is about 5.4 C per 1000m.

Larson and Larson (2001) reported how to determine the natural heating and cooling cycles and provide a mathematical method to examine streams in different watersheds using statistical methods. The adiabatic lapse rates are important to understand in order to account for temperature differences when elevations change. The association of “shade” is misguided unless the elevation changes, stream velocity, and air temperatures are accounted for in each data set.

EPA Page 27:

EPA, therefore, believes that for ESA-listed salmonids, it is important to have strong regulatory measures to protect waters that are currently colder than EPA's recommended criteria. These waters likely represent the last remaining strongholds for these fish. Because temperatures currently do not meet EPA's recommended summer maximum criteria for many waters in the Pacific Northwest, these high quality, thermally optimal waters are likely vital for their survival and any thermal warming to these waters will likely cause harm. Further, protection of these cold water segments in the upper part of a river basin likely plays a critical role in maintaining temperatures downstream. Therefore, if downstream temperatures are currently exceeding the

numeric criteria, any upstream temperature increase will in many cases further contribute to the non attainment downstream.

COMMENT: We strongly disagree about further regulations. The situations you describe are generally at reaches affected by non point source contributions. Non point source pollution is managed best under the CWA Section 319.

Disputes have erupted between regulators and those who must conduct management activities to control water temperature. EPA has expressed it's "opinion" about management schemes that will work to control water temperatures.

It seems that if EPAs position that riparian vegetation and shade will cool stream water and prevent stream temperature increases, then shading at point source discharges could be part of the guidance that would be acceptable to resolve thermal concerns for NPDES permits. Shade over a stream according to EPA's technical papers means that increasing shade and the prevention of destruction of shade will resolve the human impact temperature increases.

If the "shade theory" is correct we suggest that the "shade theory" is ubiquitous and should work for thermal increases regardless of the point source or non point source contribution and it should work throughout Region 10. If a theory is indeed the proper theory, then it must work the same everywhere and work the same through all seasons.

The "shade theory" continues to confuse us when we assess wintertime water temperatures in the streams. Leaves fall from trees along stream corridors in many places thus permitting more sunlight on the stream surfaces. Yet, these reaches when compared to reaches with conifer buffers are not different if elevation and air temperatures are considered.

We suggest incorporating the literature submitted with these comments and shipped to Region 10 headquarters. The copies of the literature will be helpful in providing insight about how water heats and cools and the means to test the rates of increases and decreases while considering environmental factors.

After reading and learning about the methods to capture information according the natural Physics laws, then further regulation can be considered. At the moment EPA has not provided a link between the need for a regulation and the action the document suggests would be required. The "nexus" is not made.

EPA: *The recommended metric for all of the criteria below is the maximum 7 day average of the daily maxima (7DADM). This metric is recommended because it describes the maximum temperatures in a stream, but is not overly influenced by the maximum temperature of a single day. Thus, it reflects an average of maximum temperatures that fish are exposed to over a week period. Since this metric is oriented to daily maximum temperatures, it can be used to protect against acute effects, such as lethality and migration blockage conditions.*

COMMENT: We disagree. A 7 day maximum tells us nothing about the stream. It fails to consider the influence of the overnight low temperatures which sets the cycle for the day. Cool air masses change the overnight lows and influences the rate of heating on each day. Some areas do not cool much overnight when air temperatures reach 95-100 °F routinely. Water temperatures in these areas often do not get below 64 °F overnight and if the 5 am coolest temperature of the day exceeds the standards, it is unlikely they will ever meet a standard based on a 7 day average.

The guidance document is too narrow and does not reflect the knowledge about stream temperatures people have after establishing water temperature databases for over 10 years. Our comments have pointed out many of the errors both in the first draft and this second draft. EPA must demonstrate more expertise on the topic than what has been offered so far.

COMMENT: If Region 10 EPA had considered some of the other papers submitted in April, 2000 and allowed themselves to receive an objective review of their work, “natural” water temperatures would not appear to be so hard to determine. The information used for this Guidance document is too limited to understand the issue. It is not difficult to determine “natural”. “Natural” didn’t disappear with the arrival of the human. It’s still out there and it is certainly measurable.

How often does human caused degradation occur? Is this on every stream? We are certain that the statement is erroneous and suggest this section be deleted. It does not reflect an understanding of the watersheds and how they function. Region 10 EPA apparently does not know that riparian shade, in-stream flow and ground water influx influences on water temperature are somewhat limited. The literature review must be expanded to cover the topic of water and not just fish. The meaning of the the term “synergistic negative effect” escapes us. We suggest deleting such phrases.

COMMENT: Region 10 EPA appears to want to have it both ways: It’s too hard, our knowledge is limited, yet our scientific knowledge is extensive. These circular explanations are free of content. This document should be rewritten and before the new version is put out for review we suggest that it be edited so there is some continuity between sections and content is put in.

It is absurd to state that scientific understanding of stream temperature dynamics is imperfect. This may be true for the limited disciplines that EPA has incorporated into the literature, but it is not true for scientists who study the water. We are attaching a reference list that we hope will be considered as Region 10 begins their rewrite. Many of the textbooks and articles should be helpful to get the agency clear about the difference between fish science and water science.

COMMENT: The pollution of Oregon’s water cannot be a menace or nuisance or be harmful to the uses listed in the policy. We suggest that Region 10 EPA consider the other beneficial uses that could be impaired if the water quality criteria for temperature standards are not scientifically sound and defensible. NMFS has suggested that buffers of widths up to 100 feet and more are needed to provide “large woody debris” for fish. Although this is yet unclear as to how LWD is going to reach the streams from 100 feet and more, the threat to the impairment of *domestic, agricultural, industrial, recreational and other legitimate beneficial uses of water* is real when flooding events take place and log jams destroy personal property as well as the riparian buffer providing the LWDs.

The Guidance document cannot ignore all other state beneficial uses that must be protected by the water temperature standard. The Issues Papers do not discuss these other uses and the affect the temperature standards will have on them. Region 10 Guidance is off track. We suggest rewriting this section so that a fair discussion of all beneficial uses can be included to give guidance on how to handle the various State policies.

Conclusions

The shade and buffer theory being pushed by the government "scientists" is equal to the first theory of heat established in 384-322 BC by Aristotle. Aristotle believed that heat is what produces the

sensation of hotness which is exactly how National Marine Fisheries Service and US Fish and Wildlife personnel, and EPA scientists have been determining the cause of stream heating in salmon habitats. They stand in the shade, feel cooler, and then believe shade will cool water also. Unfortunately a human body's response to sunshine and to shade is physiological and is different than a body of water.

We no longer base heating laws on the Aristotelean "thought experiments" that the human can feel temperature as heat and our personal sensations can be transferred to everything around us. The idea that a sense of how hot or cold an object feels to determine how much "heat" is present, gave way when Galileo Galilei invented a thermoscope in the late 1500s. And in the mid 1800s Rudolph Clausius developed the modern theory of heat, known as the Laws of Thermodynamics. We suggest reading Motz and Weaver (1991).

Through the development of experimental methods and math theories we now can objectively describe heating processes using these fundamental physical laws. They direct us on how to investigate stream water heating in a watershed, as well as air and soil temperature changes. Thermometers are based in the laws of Thermodynamics and humans are not reliable thermometers. The shade and buffer theory (water will cool with a canopy of trees blocking the sunshine from the stream surface) is utter nonsense. It sounds good, is easy to believe, but it's wrong.

Oregon and Washington landowners have an extensive database of water temperatures from thousands of miles of stream (collected over the last 7 years) that indicates the streams are heating according to the Thermodynamic Laws.....not the Aristotelean law. The water studies are published in professional science journals by many researchers. Region 10 EPA Guidance suggests that it is more important to be politically correct rather than factually accurate. The Guidance makes claims about ecosystem degradation based on "thought experiments", an interpretation of literature regarding fish physiology, and modeling ideas. Structured science and experimental applications of the physical laws have been ignored.

The Guidance is unacceptable in its current form.

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February 22, 2002

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RE: Comments on Draft EPA Region 10 Guidance for State and Tribal Temperature Water Quality Standards (Public Review Draft, October 2001)

Dear Mr. Palmer:

On behalf of the more than 24,000 Washington State Farm Bureau members representing farmers and ranchers, I am submitting the following comments on Draft EPA Region 10 Guidance for State and Tribal Temperature. Since Farm Bureau members would be uniquely impacted by the draft guidance we submit the following comments

Even though the document is called “guidance” it seems to act like a rule. As a rule, it would have to go through a more strenuous process. If this “guidance” is to be implemented in the fashion indicated, it is **arbitrary and capricious** because:

- Value judgments, not science, drive the document.
- No convincing legal rationale for mandating temperature standards as indicated in the document is offered.
- Region 10 seems to be departing from the agency’s national criteria.
- Region 10’s draft Guidance improperly demands “optimal” conditions for a single designated use instead of broad protection for all uses.
- Water quality criteria may not include implementation methods.
- ESA Section 7 consultation does not increase EPA’s power over state water quality standards.
- EPA has overstepped its CWA authority in suggesting these guidelines.
- The public involvement and scientific peer review processes used by EPA for development of the draft Guidance and Issue Papers are seriously flawed.
- Region 10’s process for selection of numeric criteria is based largely upon a cautious and conservative policy rather than on technical and scientific analysis.

ADDITIONAL ISSUES:

1. The document violates NEPA by failing to provide local governments or citizens with specifics necessary to determine the plans affect on individual businesses, local customs and cultures or local economies.
2. The document exceeds its statutory authority by reaching beyond CWA authority.

3. The proposal violates NEPA by not thoroughly disclosing the consequences of the proposal.
4. The proposal violates the Intergovernmental Cooperation Act that requires federal agencies to take into account all viewpoints and objectives—national, regional, state, and local.
5. The proposal violates The Rural Environmental Conservation Act that requires coordination with local units of government.
6. The proposal violates the Resource Conservation Act that requires agencies cooperate and coordinate with local governments.
7. Further violations of NEPA:
 - The agencies failed to provide a full and fair discussion of the significant potential impacts of the proposed action;
 - There was not reasoned analysis;
 - The analysis was not reasonably detailed and thorough;
 - There was no “cumulative impact analysis”;
 - The agencies engaged in “piecemealing”;
 - The document lacked relevant and essential information;
 - The agencies failed to adequately consider all of the evidence;
 - and, the discussion of economic impacts is seriously flawed.
8. Pursuant to the Constitution, the agencies action must not result in a taking of private property, property rights or investment-backed expectations without due process and just compensation. There has been no takings implication assessment pursuant to Executive Order 12630. This analysis needs to be completed prior to implementation of any decision.
9. The proposal has failed to complete a Regulatory Flexibility Analysis as required by the Small Business Regulatory Enforcement and Fairness Act.
10. It violates the Unfunded Mandates Executive Order due to the major change in CWA policy and associated economic implications that have no legislative directive or funding.
11. The proposal violates NEPA by selectively using questionable science to ensure a predetermined outcome.
12. The scientific validity of the document cannot be defended. Currently, there are numerous studies coming out that seem to contradict the proposal and its mandates.

This document is not acceptable in its current format and seems to be in violation of NEPA and APA. Farm Bureau believes that if EPA finds the need to draft guidance on temperature issues, the agency needs to take into account the severe legal, policy and scientific flaws with this current document and go back to the drawing board.

Farm Bureau has read through the comments provided by Oregon Forest Industries Council and is in support of those comments in addition to the more abbreviated comments above. We have attached Oregon Forest Industries Council comments and would like to incorporate their comments into Farm Bureau's comments. Also, due to the ongoing changing landscape scientifically and technically with these issues, Farm Bureau asks for the right to further supplement our comments.

We thank you for the opportunity to provide comment and hope that you will amend the document as we suggest.

Sincerely,

Hertha L. Lund
Assistant Director of Government Relations
Washington State Farm Bureau
360-357-9975
hlund@wsfb.com

cc.
Rep. Jennifer Dunn
Rep. George Nethercutt
Rep. Doc Hastings
Mark Maslyn, American Farm Bureau Federation

November 26, 2002

Via email: palmer.john@epa.gov

John Palmer
USEPA Region 10
1200 - 6th Avenue
Seattle, Washington 98101

Dear Mr. Palmer:

On behalf of more than 30,000 Washington State Farm Bureau members representing farmers and ranchers, I am submitting the following comments on the EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards, 2nd Public Review Draft.

Even though there have been minor improvements in the 2nd draft, Farm Bureau still has many of the same concerns. Therefore, we ask that our formal comments on the earlier Draft EPA Region 10 Guidance for State and Tribal Temperature Water Quality Standards (Public Review Draft, October 2001) be included by reference in this round of public comment.

Agriculture is important to the economy in the state of Washington and is one of the state's largest employers paying out between \$3-4 billion in wages and salaries per year. Also, there is around \$5.3 billion worth of food and fiber produced on Washington State farms and ranches per year. This translates into \$26 billion in economic impact to the community. Implementation of the standards in this document would have a damaging impact on agriculture in the state of Washington.

The standards are not based on best available science, are beyond EPA's authority, violate various federal acts, and are unnecessary. In addition to earlier comments, Farm Bureau provides the following additional comments:

- a) We appreciate and agree with the State of Washington's comments insofar as they discuss different interpretations of the science and they focus on standards that are too restrictive.
- b) Scientist James J. Anderson has stated that much of the science behind restrictive temperature standards is beyond what is necessary for salmon and bull trout.
- c) We disagree with EPA's interpretation of law as to its statement that "EPA must propose and promulgate appropriate WQS itself, unless appropriate changes are made by the State or Tribe." Judges have held otherwise and

we suggest that EPA corrects its misstatement of law. *See for e.g. National Wildlife Federation v. Browner*, 127 F.3d 1126 (D.C. Cir. 1997).

- d) We disagree with EPA's interpretation that 7(a)(2) of the ESA requires that EPA promulgate these guidelines. Since EPA is not getting or giving any blanket or any type of assurances, this guidance document is not necessary and may even cause further legal and technical problems for those states or tribes seeking approval of their WQS.
- e) We disagree with EPA's interpretation of law where they state because of the federal trust relationship with tribes that EPA must ensure that its WQS actions do not violate treaty-fishing rights in almost anyplace a fish may swim. This is not the current standard of law and this issue is on appeal to the 9th Circuit, which has stated that a tribal reserved water right in water "secures so much as, but not more than, is necessary to provide the Indians with a livelihood—that is to say, a moderate living." *United States v. Adair*, 723 F.2d 1394, 1415 (9th Cir. 1983) cited in *United States v. Boyd P. Braren et al*, No. 0-35441 9th Cir.
- f) We believe that it is beyond EPA's statutory authority to promulgate regulations or guidance for temperature standards. In *NRDC v. EPA* the Court held that EPA's "duty under the CWA is not to determine whether the state used EPA recommended criterion but instead to review state water quality standards and determine whether the states' decision is *scientifically defensible and protective for beneficial uses*." *NRDC v. EPA*, 16 F.3d 1395 (4th Cir. 1993).
- g) The Clean Water Act's authority gives the states primary authority for establishing water quality standards. And based upon case law, EPA's review of those standards is limited to determining whether those standards are "scientifically defensible and protective for beneficial uses." Therefore, this draft goes beyond EPA's authority and is unnecessary since the authority to develop standards has been granted to the states.
- h) EPA did not use best available science or credible data to develop the standards used in the draft guidance document. Much of EPA's national temperature guidance is more than 20 years old, only takes into account modeling examples for salmon and bull trout and does not take into account actual data and information from whole river systems.
- i) EPA's suggestion that a Use Attainability Analysis is a potential way to meet numeric criteria that were nonexistent historically and/or incapable of being met currently is not accurate. A UAA is an extremely costly and time consuming project that is out of reach of most farmers and ranchers who will be negatively impacted by this guidance document.

- j) EPA's suggestions of how to meet temperature water quality standards in Section VII are lacking in scientific data as cause or remedy for supposed temperature problems.

We thank you for the opportunity to provide comments and hope that EPA will drop this project that we believe is arbitrary and capricious, goes beyond EPA's authority, is based upon faulty science, and provides alternatives, such as the UAA, that are unattainable by the farmers and ranchers who will be significantly impacted by the standards included in this document.

Sincerely,

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cc.
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Mark Maslyn, American Farm Bureau Federation

Forestry, Pulp, and Paper Comments



November 25, 2002

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RE: Draft EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature
Water Quality Standards (2nd Public Review Draft, October 10, 2002)

Dear Mr. Palmer:

Please accept these comments on behalf of the American Forest Resource Council (AFRC). The AFRC represents nearly 90 forest product manufacturers and forest landowners—from small, family-owned companies to large multi-national corporations—in twelve states west of the Great Lakes. AFRC's mission is to create a favorable operating environment for the forest products industry, ensure a reliable timber supply from public and private lands and promote sustainable management of forests by improving federal laws, regulations, policies and decisions that determine or influence the management of all lands.

We appreciate this opportunity to comment on the second draft of the temperature guidance. (Please note AFRC also commented on the first draft of the guidance document.) We believe that EPA has improved the document, but there are still several issues that still need to be addressed to assist the States and Tribes in developing credible, defensible water temperature standards.

AFRC would like to point out that the temperature guidance is expected to be exactly that: *guidance*. This EPA project is not the forum for waging final technical arguments or definitively answering all questions. The document, to be truly useful, should set out to define the decision space for States, not the decision itself. For example, the specification of specific numeric criteria is deciding whereas proposing acceptable ranges of numbers is guidance.

We would like to reference comments made by the Oregon Forest Industries Council. AFRC believes that in total these comments will be extremely valuable to EPA in crafting a final document that will be helpful to the States during the development of their proposed temperature standards.

Specific Comments

EPA makes reference to an "expedited" review during consultation if States would choose this approach. Unfortunately, this claim of an expedited review lacks assurance and borders on extorting the States to 'use our method or else'. Furthermore, this reference to an "expedited"

review leads us to believe submittals not following the guidance to the letter will be subject to a greater level of detailed review. AFRC believes all submittals should undergo the same level of review regardless of how it follows this guidance.

EPA seems to assume at least two things in the guidance with which AFRC disagrees. First, one must accept that temperature is a ubiquitous problem. Not just a small, localized problem, but also a landscape level, population threatening problem. The connection between actual at-risk fish populations and temperature is weak. Similarly, EPA does not demonstrate technically why national 304(a) criteria are insufficient.

EPA maintains it has chosen numeric criteria "near the warm end of the optimal range," yet this assertion cannot be independently verified. Picking a number based on a preponderance of laboratory data and "adjusting" it a few degrees to account for variable temperature regimes that fish actually experience is unacceptably arbitrary. AFRC accepts that the interaction of variable temperature regimes, duration of fish exposure to suboptimal temperatures, and fish behavior is a complex problem. Simply asserting that EPA has chosen a number near the warm end of optimal without exploring these complexities is unsubstantiated. Moreover, EPA's hypothesized "worst case scenario" (i.e., low flow, low food, higher than optimal temperatures) that leads to given criteria is not ecological fact; another equally valid hypothesis is that the worst case scenario is an acceptable condition for the period. This latter hypothesis would suggest that fish are exposed to optimal temperatures during other periods, thus maximizing growth and vigor when food is readily available. EPA must eliminate its "colder is always better" mantra and accept that optimal temperature ranges mean that water can be unfavorably warm and undesirably cool at times throughout the life cycle of salmonids.

EPA continues to misrepresent many physical processes. EPA mistakenly asserts that upstream temperatures will "play a critical role in maintaining temperatures downstream." EPA continues to misunderstand the equilibrium temperature concept. While it is true that release of cool reservoir water will result in persistent cooler temperatures some distance downstream of the dam, smaller streams (and larger rivers without dams) are always seeking an equilibrium temperature that tracks the ambient air temperature. Significantly changing water temperature at some point upstream simply changes how quickly the water warms or cools to the equilibrium temperature downstream.

EPA has missed a chance to define what elements would be proper for a State to include in a Standards "submittal package." Many elements of existing State programs are appropriate supporting material upon which EPA can rely when approving a State standard, yet EPA has chosen to list only some programs and not others. The list should be deleted in favor of identifying which elements are appropriate for inclusion and why.

EPA should fully recognize the roles and authority that States possess in formulating water quality standards. Not just in statement, but in meaning. EPA should not preclude opportunities for states to construct water temperature standards that deviate from EPA recommendations but are in fact grounded in local knowledge and credible science. Nor should EPA suggest in its guidance so many facets of a standard that the States are effectively precluded from choosing the elements that are proper and eliminating the ones that are not.

The final guidance should only contain the elements that have sound technical merit. AFRC believes that numerous technical errors and misrepresentations of biological and ecological relationships significantly weaken the guidance and either need to be corrected or deleted.

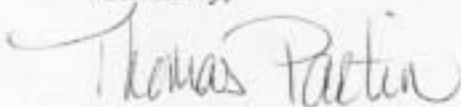
EPA should recommend ranges of numeric criteria. Choosing single numbers have opened EPA to a never ending scientific debate about "the number." In reality, no combination of scientific evidence points to one number vs. another. The final choice is one of policy, not science. Asserting that the choice is scientific invites counter productive debate. Fish thrive in a variety of water temperatures—EPA should simply recognize that.

EPA should recognize population ecology as well as single individual ecology. If one accepts that populations are at risk solely because habitat is "thermally degraded" and that suitable habitat has significantly shrunk because of that degradation, it makes sense for adjacent sub-optimal habitat to be "protected." If, on the other hand, one looks at robust fish returns and hypothesizes that temperature has not been the driving force in fish declines but that ocean conditions and their variability have, one looks at adjacent suboptimal habitat as just that. Extant populations will always seek out better habitat. When that fills up, adjacent habitat will be used to the extent that the fish can utilize it. The populations will be viable, and the displaced, least-competitive fish will be in a situation that it has always been—potential elimination. EPA should seek to better understand (or accept from the States) a more complete discussion of the conceptual workings of population dynamics.

In closing, we believe EPA could best fulfill its role achieve the CWA and ESA objectives and by providing these resources to the States, Tribes, and other interested parties. It is not necessary, appropriate or useful for EPA to recommend specific solutions for all the affected States as a group. Each State has unique physical, biological and institutional factors that could make the best solutions for it somewhat different than the best solutions for neighboring States. EPA should recruit and engage the local knowledge and creativity of state officials by providing resources that can help States make better decisions rather than attempting to prescribe uniform or inflexible solutions across the region.

We would welcome the opportunity to meet with you to discuss these comments and options for moving forward. Again, thank you for your consideration of these comments.

Sincerely,

A handwritten signature in cursive script, reading "Thomas Partin".

Thomas L. Partin
President

cc: John Iani, Regional Administrator, EPA Region 10

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BOISE

Bill Dryden
Director, Forest Resources Affairs

November 26, 2002

John Palmer
EPA Region 10
Mailstop: OW-134
1200 SW Sixth Avenue
Seattle, WA 98101

Subject: Review of "*Draft EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards (Second Public Review Draft October 10, 2002)*"

Dear Mr. Palmer:

Thank you for the opportunity to comment on the *Draft EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards*. The Boise Cascade Corporation has several interests in commenting on this draft document. First, Boise owns 1.2 million acres of forestlands in Oregon, Washington and Idaho. These lands are sustainably managed to provide a variety of forest resources including fish and wildlife habitat, water quality, grazing and timber. The draft EPA water temperature guidance will likely have an impact on the current operations and long-term management plans for those lands. In addition, Boise has wood and paper products manufacturing facilities in Yakima, Kettle Falls, Medford, LaGrande, Horseshoe Bend, Independence, Wallula, St. Helens and other northwest communities. These facilities and the thousands of jobs they provide rely upon a dependable supply of timber from private and public lands. That fiber supply is linked in many ways to federal agency actions and policy statements including the current EPA proposal.

Boise is a certified participant in the Sustainable Forestry Initiative (SFI) program and implements all state approved Best Management Practices (BMPs). We believe that BMPs should adequately protect against increases in stream temperature due to forest management activities. We fully support and participate in state programs that develop BMPs and monitor their application on our lands and other private and public lands. We believe that scientifically credible water temperature standards that are developed by the States and Tribes with full public involvement should satisfy the EPA. We suggest that any guidance from the EPA should recognize and support the States and Tribes in their roles of determining water quality standards and subsequent BMPs.

We compliment the EPA on the effort to revise and improve this water temperature guidance document. Unfortunately, we find that the document still fails to provide the States and Tribes with meaningful and workable guidance. To be useful, a guidance document must define the decision space that the EPA finds to be acceptable. However, this document is more a decision

document that tells the States and Tribes what should be the appropriate decision for water quality standards addressing temperature. Proposing an acceptable range of temperature is guidance; advocating specific temperature criteria is usurping the decision-making role of the States and Tribes.

Boise has a number of concerns regarding both the science and level of public involvement associated with the proposed standard.

Agency direction for expedited reviews.

The EPA provides a reference to an "expedited review" for States and Tribes that adopt a water quality standard consistent with the EPA standard. For States and Tribes that want to adopt such a standard, there is no assurance that they will receive an expedited review. Of more concern is the EPA's thinly disguised effort to coerce States and Tribes into using the EPA standard by intimating that alternative approaches will be subjected to lengthy and burdensome EPA reviews.

Poor use of previous research in support of the recommended numeric criteria.

Much of the justification for the recommended numeric criteria is derived from two studies that show the effect of riparian vegetation removal on water temperature: Upper Grande Ronde TMDL and Theurer et al. (1985). These studies are not empirical and do not demonstrate the effects of riparian vegetation management on stream temperature and fish condition. Rather, these studies were simply modeling exercises, and as such, their findings are only as good as the models developed and associated assumptions. Furthermore, Theurer et al. (1985) compared temperatures under existing riparian conditions to differing degrees of "climax riparian vegetation." It is generally acknowledged that the concept of "climax" vegetation is obsolete, unsustainable in a dynamic system and many never have existed historically.

Misunderstanding or misrepresentation of scientific information.

Even after significant testimony and information sharing workshops, the EPA either misunderstands some basic scientific information regarding stream temperature or has decided to misrepresent this information in the proposed guidance. In either case, this significant failure of the document severely undermines its credibility with States, Tribes and others involved in the process. Specifically, on page 6, the document discusses the old myth that harvesting impacts groundwater storage and lowers stream flows. A review of current scientific literature would find that harvesting increases summer low flows due to a reduction in evapotranspiration. On page 28, the document wrongly claims that upstream temperatures have a critical impact in maintaining downstream water temperatures. Please gain an understanding of the equilibrium temperature principle. Streams and rivers are always seeking an equilibrium temperature in relationship to the ambient air temperature. The EPA premise that keeping water in forest streams colder will somehow make downstream rivers colder cannot be scientifically supported.

Bull trout rearing temperature standard

It is unlikely that the numeric standard for bull trout rearing (12° C) would actually benefit bull trout if it were achieved year-round throughout their rearing habitat across the entire Pacific Northwest. Selong et al. (2001) found that optimal bull trout growth, with unlimited food supply, occurred between 12 and 16° C. McMahon et al. (1998) found that bull trout fed at saturation had greatest growth rates at 12° C; however, there was no difference in growth rate at either 14° C or 16° C. This optimal temperature range is expected to shift downward as food supply decreases. However, McMahon et al. (1999) varied food availability to 66% and found maximum growth rates for bull trout at 16° C. At 33% saturation, maximum growth rates occurred at 12° C. McCullough (1999) opined that the typical level of feeding in the field is at the 60% saturation level. The bull trout peer review (2002) state that under limited food supply, optimal temperatures were found to range between 8 and 12° C. Rieman and Chandler (1999) found the modal frequency of bull trout presence in the field (from 237 bull trout presence records) occurred at 14° C MDMT with a range from 7° C to 20° C.

Food supply is certain to vary throughout the year. A standard of 12° C for the seven-day average of the daily maximum temperature means that for a stream to be in compliance, the daily maximum temperature cannot exceed 12° C. The water temperature has to stay below the numeric criteria and, during much of the day, is likely to be significantly colder given the diurnal variation in stream temperature. Given unlimited food supply, a stream in compliance with this standard is well below the optimal temperature for bull trout. Given a limited food supply (either at 66% or 33% of saturation), a stream in compliance with this standard is likely to be near or below the lower end of optimal temperature for bull trout for much of the day.

The guidance document is advocating a temperature that is actually likely to be detrimental to bull trout.

Inconsistent logic throughout document

On page 28 of the Draft Temperature Water Quality Standard, it states:

“... natural summertime temperatures in the Pacific Northwest were spatially diverse with areas of cold-optimal, warm-optimal, and warmer than optimal water.”

Because this natural variability of evolutionary condition for Pacific Northwest fish species, we do not believe it is necessary or beneficial to provide cold-optimum water throughout the entire Pacific Northwest. The temperature requirements simply do not make physical or biological sense. In addition, as the guidance defies common sense, it makes it very difficult to engage citizens in constructive activities to improve water temperatures in those cases where there is a true need.

Use of EPA Best Scientific Judgment

Boise is concerned that the selection of the numeric thresholds that reflect temperatures “near the warm end of the optimal temperature range” cannot be independently corroborated and is not

scientifically credible. Picking a number based on a preponderance of laboratory data and "adjusting" it a few degrees to account for variable temperature regimes that fish actually experience is unacceptably arbitrary. The selection of numeric criteria is based on the EPA considering a number of general factors (Draft EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standard, October 2002, pg. 14, 17 and 19). We feel it is important for EPA to define what is meant by optimal temperature and characterize the recommended numeric criteria quantitatively.

Dismissal of the 304(a) national criteria is poorly explained

EPA acknowledges the 304(a) national criteria, but fails to adequately explain why they do not protect against chronic and sub-lethal effects. Vague references to chronic or sub-lethal effects do not explain why the national criteria are not sufficient to protect fish. To justify any regional guidance document, the EPA must first demonstrate why the national guidance is not sufficient. This draft does not make that case for the EPA.

Based upon our review and the above comments, Boise recommends the following actions.

EPA should fully recognize the responsibilities and authority of the States and Tribes.

States and Tribes have the responsibility and authority under the Clean Water Act to develop water quality standards. The EPA should not create cumbersome processes for the development of temperature standards that are based in credible science and local knowledge even when the standard deviates from EPA guidance. EPA guidance should describe a range of options for States and Tribes to consider. The present proposal essentially sets a standard and then challenges the States and Tribes to either meet it or suffer federal agency review processes.

EPA should demonstrate the need for a regional guidance document.

The EPA must demonstrate that the national guidance is not sufficient to address the development of water temperature standards in the Pacific Northwest. Without that effort, the EPA has no rationale for developing a regional guidance document and should withdraw this draft in favor of the national guidance.

EPA should provide guidance that does not increase the complexity nor reduce the flexibility of the States and Tribes to do their job.

The EPA should remove those elements of the guidance that do not have scientific credibility and correct any misrepresentations or misinterpretations as noted above. Undefined terms such as "core rearing areas" and "mainstem river" should either be removed or defined. Finally, value terms such as "thermally degraded" and "shrunk distributions" should be removed from the document. Any failure by the EPA to address these items will damage if not destroy the credibility of the guidance document and leave the States and Tribes in a position ripe for litigation.

EPA should increase the public involvement efforts for future draft guidance documents.

The EPA should develop a more open and inclusive process if it plans to move forward with an improved version of the guidance document. Counties, cities, utilities, business interests, public and private landowners and others should be permitted to assist in the development of an improved guidance document. The EPA should openly seek the best available scientific information rather than relying upon closed panels of "experts".

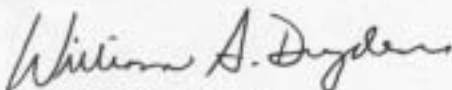
EPA should provide an economic analysis.

The EPA should identify the range of costs that States and Tribes can expect in developing and administering standards and the costs to the private sector of compliance.

In addition to these comments, by reference, Boise includes the comments of the Oregon Forest Industries Council (OFIC) Intermountain Forest Association, (IFA) and Washington Forest Protection Association (WFPA) and asks EPA to consider and address those comments and recommendations in the review of the draft guidance document.

Thank you for the opportunity to comment. Please keep this office advised regarding the results of your review of public comments and other opportunities to be involved in this effort.

Sincerely yours,



William A. Dryden
Director, Forest Resources Affairs

CC: John Iani, Regional Administrator, EPA Region 10
Chris Jarmer, OFIC
Ann Goos, WFPA
Jane Gorsuch, IFA



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November 22, 2002

John Palmer
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Mailstop: OW-134
1200 S.W. 6th Avenue
Seattle, WA 98101

Subject: Review of the Second Draft EPA Region 10 guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards (2nd Public Review Draft, October 10, 2002).

Dear Mr. Palmer:

The Intermountain Forest Association (IFA), on behalf of its members in states regulated by Region 10 EPA, submits the following comments regarding the above referenced document. We appreciate the opportunity to comment again on this matter.

IFA represents large and small industrial and non-industrial forest landowners and mill operators in Idaho, Oregon and Washington. Since the inception of this process we have requested to be at the table to provide input, data and common sense, hoping to affect positively the outcome of the final document. We have also participated in the public process by attending the December 2001 workshop in Boise, Idaho as well as the more recent public meeting in Boise held on November 15, 2002. After reviewing the second draft *EPA Region 10 Guidance for State and Tribal Temperature Water Quality Standards (Draft Guidance 2)*, it is apparent that, while EPA has held numerous meetings with affected sectors, attempts to meaningfully alter the document so that it will work on the ground and actually benefit fish, have not been successful.

We, along with our colleagues in the region, continue to have serious concerns with the outcome of the EPA process and continue to question the need for this document. Not being a party to the agreements in other states that seem to drive the issuance of this guidance; we do not see the necessity of the document. Originally, EPA indicated that the guidance, if adopted by a state as water quality standards, would be the basis for "expedited" ESA consultation. EPA now maintains that this will not be the case.

After reviewing the new draft, it remains apparent that the select group-of-scientists “at the table” continues to use the same underlying assumptions: 1) that colder is better; and 2) that the laws of thermodynamics do not apply to streams in the region. Any document issued with these underlying assumptions are sure to recommend numeric criteria that are not correct, are unreachable in many areas, and will result in thousands of stream segments being added to each State’s 303(d) lists. This will cause TMDL’s to be developed and implemented on streams at great financial cost to states, local watershed groups and local landowners—for no other reason than they do not meet an EPA derived numeric standard. Healthy fish populations may well exist in these same streams that may never meet the standard. Under this draft, the only way a state could avoid a costly TMDL, would be for the state to conduct a costly Use Attainability Analysis, which we point out has little track record of EPA approval.

Based upon the draft cited above, we submit the following list of concerns:

1. There are no assurances that the states “can expect an expedited review by EPA and the Services” if the state WQS is consistent with EPA guidance;
2. EPA acknowledges the 304(a) national criteria, but fails to adequately explain why they do not protect against chronic and sub-lethal effects. We do not understand why EPA believes that the national numbers are not protective.
3. IFA is concerned that the selection of the numeric thresholds that reflect temperatures “near the warm end of the optimal temperature range” cannot be independently corroborated and is not scientifically credible – rather the selection is based on the EPA considering a number of general factors (Draft EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standard, October 2002, pg. 14, 17 and 19).
4. EPA’s “facts” regarding processes influencing stream temperature are incorrect.
5. EPA continues to misrepresent and misinterpret the equilibrium temperature concept.
6. The recommendations for maintaining cold water in cold-water streams make it more advantageous for a landowner to operate along an impaired stream rather than along a cold one.
7. EPA has shown poor use of previous research in support of the recommended numeric criteria. Much of the justification for the recommended numeric criteria is derived from two studies that show the effect of riparian vegetation removal on water temperature: Upper Grande Ronde TMDL and Theurer et al. (1985). These studies are not empirical and do not demonstrate the effects of riparian vegetation management on stream temperature and fish condition.
8. Numerous factual errors are contained under the heading “Human Activities that Can Contribute to Excess Warming...,” which attempts to justify the need for reconsidering WQS. Use of the Upper Grande Ronde TMDL and Theurer et al. (1985) do not demonstrate the effects of riparian vegetation management of stream temperature and fish condition.

9. It is unlikely that the numeric standard for Bull Trout rearing (12° C) would actually benefit Bull Trout if it were achieved year-round throughout the Pacific Northwest. Selong et al. (2001) found that optimal bull trout growth, with unlimited food supply, occurred between 12 and 16° C. McMahon et al. (1998) found that bull trout fed at saturation had greatest growth rates at 12° C, however, there was no difference in growth rate at either 14° C or 16° C. This optimal temperature range is expected to shift downward as food supply decreases. However, McMahon et al. (1999) varied food availability to 66% and found maximum growth rates for bull trout at 16° C. At 33% satiation, maximum growth rates occurred at 12° C. McCullough (1999) opined that the typical level of feeding in the field is at the 60% satiation level. The Bull trout peer review (2002) state that under limited food supply, optimal temperatures were found to range between 8 and 12° C. Rieman and Chandler (1999) found the modal frequency of bull trout presence in the field (from 237 bull trout presence records) occurred at 14° C MDMT with a range from 7° C to 20° C.
10. Food supply is certain to vary throughout the year. A standard of 12° C for the 7 Day average of the Daily Maximum Temperature means that for a stream to be in compliance, the daily maximum temperature cannot exceed 12° C. Therefore, during much of the day, the stream is likely to be significantly colder given the diurnal variation in stream temperature. Given unlimited food supply, a stream in compliance with this standard is well below the optimal temperature for Bull trout; and, given a limited food supply (either at 66% or 33% of satiation), a stream in compliance with this standard is likely to be near or below the lower end of optimal temperature for Bull trout for much of the day.
11. There is inconsistent logic throughout document. On page 28 of the Draft Temperature Water Quality Standard, it states:

“ . . . natural summertime temperatures in the Pacific Northwest were spatially diverse with areas of cold-optimal, warm-optimal, and warmer than optimal water.”

Because this natural variability is a condition that the Pacific Northwest fish species have evolved with, we do not believe it is necessary, or beneficial, to prescriptively require States to attempt to provide cold-optimum water throughout the entire Pacific Northwest. The temperature requirements simply do not make physical or biological sense. In addition, as the guidance defies common sense, it makes it very difficult to engage citizens in constructive activities to improve water temperatures in those cases where there is in fact a need.

We are supportive of temperature guidance that recognizes the roles and authority that states possess in formulating water quality standards. EPA should not preclude opportunities for states to construct water temperature standards that deviate from EPA recommendations, but are grounded in local knowledge and credible science.

The new draft guidance relies on broad performance measures for all regional states to use for reconsideration of its individual water temperature standards. We do not believe

that EPA can adequately draft a guidance of this nature and object strenuously to the current effort.

EPA must recognize each state's individual role in formulating and implementing water quality standards for the unique situations in each state. EPA must provide a high level of flexibility to meet the geographic needs of each state. While the second draft Regional Water Temperature Guidance is an improvement over previous drafts, IFA believes that numerous technical errors and misrepresentations of biological and ecological relationships need to be corrected before it could be used as a guidance to develop technically-credible water temperature standards.

EPA should not add additional guidelines and provisions to the document that would increase complexity and reduce flexibility for implementation by states.

Because of these concerns, we ask that EPA suspend the current document, create a more open and inclusive process including both private and state sector land management entities, counties, cities, utilities, business, industry and other affected stakeholders and recast the document to create an alternative outcome consistent with federal and state law and current national guidance under the CWA and ESA, and be consistent with the best available scientific and technological information. In addition, we ask that in relation to any new guidance document, EPA include an Economic Impact Analysis that quantifies the costs to states and the private sector of implementation of any standards created in any future Draft Guidance.

We look forward to your response to comments.

Sincerely,

A handwritten signature in black ink, reading "Jane A. Gorsuch". The signature is fluid and cursive, with the first name "Jane" and last name "Gorsuch" clearly legible.

Jane A. Gorsuch
VP Idaho Affairs

CC: Senator Larry Craig, Senator Michael D. Crapo, Representative Mike Simpson, Representative C.L. "Butch" Otter, Governor Dirk Kempthorne, Lt. Governor Jim Risch, Senator Laird Noh, Representative Bert Stevenson, Senator Robert Geddes, Representative Bruce Newcomb, Mr. Jim Caswell, Mr. Greg Schildwachter, Mr. David Mabe, Mr. Steve Allred

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December 10, 2002

John Palmer
EPA Region 10
Mailstop: OW-134
1200 S.W. 6th Avenue
Seattle, WA 98101

Re: Review of "Draft EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards (2nd Public Review Draft, October 10, 2002)"

Dear Mr. Palmer:

Longview Fibre Company would like to submit the following comments on the above referenced Guidance document. This draft is a significant improvement over the EPA's initial proposal, but several issues and concerns should be addressed before the final guidance is issued.

We have participated in reviews done by both the Oregon Forest Industries Council and the Washington Forest Protection Association. We support the comments you will receive from both of these organizations and include them by reference in our comments.

In addition, we believe the following issues must be addressed:

1. The Guidance should recognize the Oregon Plan For Salmon and Watersheds as one of the state level programs that is improving water quality generally and conditions for salmonids in particular. The Oregon Plan has an impressive record of accomplishments that should be recognized by EPA.
2. The Issue Papers developed by the EPA as background and supporting information to the Guidance are seriously flawed and need to be revised and rewritten to respond to the many technical comments received earlier in your process.
3. The EPA apparently continues to believe that actions in small headwater streams can influence water temperatures far downstream. Data and models exist to demonstrate how limited these downstream effects are for small streams and how quickly the equilibrium temperature concept takes effect. The final guidance should include a more complete discussion of the equilibrium temperature effect on small, medium and large streams. A comparison of the downstream influence distance for different stream types and sizes should be included.
4. The process for identifying and dealing with naturally warm streams needs improvement. The method for identifying these streams must be simple and cost effective to employ. The temperature guidance for these streams must have some flexibility beyond "no additional increase".

We appreciate the opportunity to comment on the draft guidance. If I may be of any help in clarifying our comments, please contact me.

Very truly yours,

Blake S. Rowe
Asst. Sr. Vice President - Timber

ct

November 26, 2002

John Palmer
EPA Region 10
Mailstop: OW-134
1200 S.W. 6th Avenue
Seattle, WA 98101

Subject: Review of “*Draft EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards (2nd Public Review Draft, October 10, 2002)*”

Dear Mr. Palmer:

The Northwest Pulp and Paper Association (NWPPA) appreciates the opportunity to provide comments on EPA Region 10 Guidance for “Pacific Northwest State and Tribal Temperature Water Quality Standards,” 2nd Public Review Draft dated October 10, 2002, also commonly referred to as the Regional Temperature Guidance (RTG 2nd draft in these comments).

NWPPA represents the pulp and paper mills in the Region 10 states of Washington, Oregon, and Idaho. NWPPA commented extensively on the first draft of the RTG and wishes for those comments to be incorporated by reference in this proceeding as well. These are re-attached for convenience. NWPPA works closely with the forestry associations in Region 10 and also supports the comments of those organizations as well. NWPPA represents the perspective of pulp and paper mills as point sources located on large mainstem rivers with discharges subject to the NPDES permitting program. Consequently NWPPA examines the draft RTG in terms of our knowledge of these large mainstem rivers whereas the forestry associations tend to have more knowledge of upriver conditions. We believe our comments to be consistent.

NWPPA appreciates EPA 10's efforts to resolve some of the major issues raised by NWPPA and the regional forestry associations regarding the first draft of the RTG including: (a) legal and policy issues such as the relationship to Section 304 of the Clean Water Act (CWA) and the role of state discretion in setting water quality standards; (b) the technical basis of the guidance which more clearly acknowledges the fact of historically warm water temperatures of some rivers in the Pacific Northwest; and (c) simpler and clearer recommendations for state water quality standard setting including technical details applicable to point sources discharges.

NWPPA has remaining concerns or additional information for the record in each of these areas which can be summarized as follows:

I. Legal and Policy Issues

A. EPA/State Roles In Setting Water Quality Standards

- The RTG 2nd draft is an improvement over the first draft.
- EPA has described its role as specified in the CWA and ESA but by omission, still downplays the role of States under the CWA.
- Under the CWA, states have the primary responsibility and may take into account state-scientific knowledge of unique environmental landscape that may affect water quality standard setting.
- The standard of review that EPA must apply under the CWA is whether state water quality standards are scientifically defensible.
- The RTG should be clear that this substantive standard of review is not being changed; that the primary purpose of the RTG is to allow expedited review.

B. States Options for Taking Into Account Situations Where RTG Criteria are Unachievable Needs Clarification and Less Emphasis on the Negative

- The RTD 2nd draft is an improvement in acknowledging the need to take into account historically warm waters or situations where EPA's recommended criteria are inappropriate or unachievable.
- States should clearly have the option of considering this situation at the beginning of the standard-setting process as well as in the form of adjustments to water quality standards that are later shown to be unachievable.
- Because historically warm rivers are fairly well documented and widespread in the Pacific Northwest (particularly mainstem rivers), EPA 10 should take care not to create a greater burden of proof on states wishing to take these into account.

II. Scientific Background Issues

A. Historically Warm Rivers

- The Columbia River has typically reached river water temperatures in excess of 20°C during nearly every year of record over the past seventy years.
- The Willamette River has reached equally high and typically higher water temperatures over the past seventy years.
- Salmonid numbers have experienced cycles of both high and low numbers during the past seventy years regardless of the enduring fact of water temperatures higher than the recommended criteria on mainstem rivers.
- EPA should improve its statements regarding the "equilibrium concept" for rivers.

B. EPA should not base directives for state regulatory action on new theories of alluvial gravel or hyporheic flow impairment. These theories may operate differently than EPA suggests and in any event are not quantifiable at this time

- EPA 10 introduces the theory that alluvial segments are no longer providing cold water refugia or that groundwater inflow (hyporheic flow) is impaired; however EPA offers no empirical evidence of this phenomenon.
- These theories may offer perspective and be the basis for a future generation of research but are not ready to be the basis of present day directives for state action.
- There may be contradictory evidence that temperatures of the riverbeds of large mainstem rivers is quite cool (Columbia River).
- There may be contradictory evidence that hyporheic flow is in fact quite large (Willamette River).
- Mostly importantly, there are no established models available for states to use to estimate these processes.

C. Uncertainties Regarding the Literature of Temperature Needs of Salmonids Versus Actual Conditions in the Environment

- There is likely more uncertainty with respect to the literature research regarding temperature requirements of salmonids than acknowledged by EPA 10.

III . Implementation Issues

A. State Water Quality Standards

- EPA should improve the interpretation of “no measurable increase” when states adopt narrative criteria which supercede numeric criteria when natural background provisions are higher than the numeric criteria clearly allow de minimus warming.
- Specific recommendations regarding mixing zones are appropriate; however NWPPA recommends that EPA 10 improve its statement regarding the technical support for the “instantaneous lethality” recommendation.
- NWPPA agrees with EPA’s tenets for protecting salmonids from potentially adverse effects of mixing zones, but disagrees with the prescriptive details.

In the attached detailed comments, NWPPA more fully describes these themes and offers supporting analysis including papers and monitoring data not previously submitted for the record.

We would welcome the opportunity to meet with EPA to discuss these comments as we realize we are submitting a considerable amount of new information.

Thank-you for the opportunity to submit these comments.

Sincerely,

Llewellyn Matthews
Executive Director

LM:sd

ATTACHMENTS

- A. “Summary of Information Relating to Historic Temperature Conditions of the Columbia and Lower Snake Rivers,” Paul Wiegand, NCASI (November 2002)
- B. Historic Sources of Temperature Data for the Willamette River (numerous references available upon request)
- C. “Temperature Study Results for Critical Period June 15 to September 15, 2002 for Columbia River and White/Stuck River (prepared for NWPPA by Parametrix Executive Summary and Appendices
- D. “Willamette River Basin Temperature Monitoring Results – 2002” (prepared for NWPPA by SECOR)
“Willamette River Basin Temperature 2001/2002 Data Analysis” (prepared for NWPPA by SECOR)
- E. “Precipitation – Runoff and Streamflow – Routing Models for the Willamette River Basin, Oregon,” Laenen and Risley, US Geological Survey Water-Resources Investigations Report 95-4284 prepared for Oregon Department of Environmental Quality (1977)

**NORTHWEST PULP AND PAPER ASSOCIATION
DETAILED COMMENTS
November 26, 2002**

***EPA Region 10 Guidance
For
Pacific Northwest State and Tribal Temperature Water Quality Standards
2nd Public Review Draft dated October 2002***

I. Legal and Policy Issues

Issue:

The RTG should contain a better statement of the roles assigned by the CWA to EPA and the states in setting water quality standards.

The RTG should contain a statement of the standard of review which EPA must apply.

The RTG 2nd draft is an improvement over the first draft in explaining the role of this guidance in EPA review and approval/disapproval of state temperature water quality standards. The RTG 2nd draft still falls short in giving an adequate account of the primary role of states in setting water quality standards and the secondary role of EPA in providing criteria and review under the Clean Water Act (CWA).

The RTG 2nd draft at page 1 does state that “this guidance does not preclude states or tribes from adopting temperature WQS (water quality standards) different from those in the guidance. EPA would approve any such temperature WQS where EPA determined that its approval would be consistent with the CWA.” The RTG 2nd draft at page 2 also contains a statement that EPA approval must be consistent with the CWA.

The difficulty is that the RTG 2nd draft does not lay out a clear interpretation of the roles of states and the legal criteria by which EPA is bound by statute and case law authority to utilize in reviewing state water quality standards and making approval/disapproval decisions. The RTG then contains extensive analysis of EPA suggested numeric criteria. The implication becomes that EPA’s review and approval/disapproval of state temperature water quality rests primarily on this guidance. This would be incorrect.

Under the CWA and, as confirmed by case law authority, a state may use *scientifically defensible* information in designing its water quality standards. For example, a state may have knowledge of its own environmental landscape that affects the application of the recommended criteria. Alternately, a state could derive its own interpretation of the literature cited by EPA regarding the temperature requirements of salmonids.

Lastly, where a state does decide that the numeric criteria in the RTG 2nd draft are inappropriate, or not achievable, the RTG offers several forms of relief: (a) site-specific

criteria, (b) natural background conditions higher than the criteria may be accepted as superceding the criteria; and (c) Use Attainability Analysis to support a marginal use. These are important clarifications in the RTG 2nd draft.

NWPPA strongly suggests, however, that the RTG 2nd draft must be clearer in affirming the authority of states in utilizing scientifically defensible information at the outset of the process of revising water quality standards and that departures from the numeric criteria are not subject to some additional burden of proof.

EPA should also consider the resource concerns of implementation costs for states. The RTG 2nd draft suggests that use attainability analysis (UAA) and site-specific standards are alternatives to meeting the numeric temperature criterion. These policy alternatives are available now but not widely used – or used at all – by states and individuals. EPA and the states have conflicting policy views on the use of UAA and site-specific standards that should be resolved to insure a smooth process for implementing these alternatives. EPA should also consider the cost of performing such intense scientific-based work and acknowledge that these alternatives will be used infrequently, especially during times of economic downturn in the regional economy. For example, Oregon currently has only one full time equivalent (FTE) position performing UAA work in Southeast Oregon, while it has many more FTE performing TMDL work.

This is particularly important for states addressing temperature water quality standards for mainstem rivers that have lengthy historical records of temperatures warmer than the criteria. State water quality standards based on historical knowledge of the temperature regimes of these rivers should not be subject additional burden of proof, but should be accepted as scientifically defensible.

Recommendations:

The RTG 2nd draft should be revised:

- To clarify the roles of states and EPA in setting water quality standards.
- To clarify that states may take into account other scientifically defensible information.
- To clarify the use of site-specific criteria and use-attainability analysis.
- To clarify that alternative state temperature water quality standards (site-specific among others) should not be subject to additional burdens of proof, provided the scientifically defensible standard is met.
- To clarify that the purpose of the RTG is to provide a framework for expedited review...not to change the standard of review.

Supporting Discussion:

The correct standard of review for EPA to apply to state temperature water quality criteria is “scientifically defensible and protective of beneficial uses”

The standard of review that applies to EPA’s action approving/disapproving state water quality standards derives from the respective roles the Clean Water Act (CWA) assigns to the states and EPA for developing water quality standards.

While EPA and the states share duties in achieving the objectives of the CWA, the Act assigns the primary role of establishing state water quality standards to the states. 33 U.S.C. 1251(b).¹ Chevron U.S.A. Inc v. Hammon, 726 F.2d 483, 20 ERC 1501(9th Cir. 1985); District of Columbia v. Schramm, 631 F.2d 854, 15 ERC 1102 (D.C. Cir. 1980). EPA sits in a reviewing capacity of the state standards, with approval and rejection powers only. 33 U.S.C. 1313(c). NRDC v. EPA 16 F.3d 1399, 37 ERC 1953 (4th Cir. 1993).

This view has been affirmed by the Tenth Circuit, quoting NRDC v EPA Id.: “states have the primary role, under Section 303 of the CWA (33 U.S.C. 1313), in establishing water quality standards. EPA’s sole function, in this respect, is to review those standards for approval...therefore, the EPA has a limited role in reviewing state water quality standards.” City of Albuquerque v Browner, 97 F.3d 415, at 425 (10th Cir. 1996); American Wildlands v Browner, 260 F3d 1192 (10th Cir. 2001).

The standard of review applicable to EPA’s review of state water quality standards is articulated in NRDC v. EPA Id., which involved the consolidated appeal of the water quality standards implemented by Maryland and Virginia. The correct legal standard in deciding whether EPA properly approved the state water quality standards was at issue.

¹ 33 U.S.C. 1251(b) “It is the policy of the Congress to recognize, preserve, and protect the primary responsibilities and rights of states to prevent, reduce, and eliminate pollution, to plan the development and use (including restoration, preservation, and enhancement) of land and water resources.”

The court upheld EPA's view that "its duty under the CWA is not to determine whether the state used EPA recommended criterion but instead to review state water quality standards and determine whether the states' decision is *scientifically defensible and protective of beneficial uses* (emphasis is court's)." Citing 40 C.F.R. 131.5(a) and 131.6(c), 131.11 (a) and (b). The court found EPA and the lower court abided by that standard, noting that EPA adequately documented and explained its reasons for approving the states' standards. *Id* 1957 and 8. The court also took note of the regulatory scheme for setting water quality standards: "EPA regulations also provide that states should develop numerical criteria based on EPA's guidance under Section 304(a) of the CWA. EPA's criterion guidance modified to reflect site-specific conditions or other scientifically defensible methods." Citing 40 C.F.R. 131.11(b)(1).

The statutory scheme and interpretative cases clearly establish the principle that States have the primary responsibility for establishing water quality standards. EPA's review is limited to determining whether the standards are *scientifically defensible and protective of beneficial uses*. The point of departure for state development of water quality standards is EPA numeric criteria guidance; however, the state may modify EPA criteria guidance to reflect state specific site conditions, a common practice in Pacific Northwest states.²

² For example, DEQ July 28, 1995 Notice to Interested Parties and Affected Public "Rulemaking Proposal – 1992-1994 Triennial Water Quality Standards Review: Proposed Revisions to Standards" contains a section titled "Questions to be Answered to Reveal Potential Justification for Differing from Federal Requirements," states: "Because local conditions vary, EPA does not specify water quality criteria for states to follow. The proposed standards are however, consistent with EPA guidance."

II. Scientific Background Issues – Overview

The fundamental dilemma of the RTG 2nd draft is explaining how it is that historically temperatures of many rivers in the Pacific Northwest exceeded the recommended numeric criteria for salmonid lifestages, yet in recent years (and at other times over the past century), there are record runs of salmon. The RTG 2nd draft appears to rest on the assumption that waters that support salmon, despite lack of conformity to the recommended numeric criteria, are impaired. NWPPA respectfully submits that EPA should not necessarily conclude such waters are impaired. Rather, the RTG 2nd draft should:

- Give more credence to the phenomenon of naturally warm rivers rather than view them as an abnormality (the appropriate role of the RTG is to ‘protect’ rather than to drive changes never experienced in nature).
- Acknowledge the uncertainty in scientific knowledge of the needs of salmon or what they actually experience in the environment.

NWPPA suggests that both of the above themes should be taken into account so that the RTG policy recommendations can be taken in the appropriate perspective.

A. Historically/Naturally Warm Waters

Issue:

Historically/naturally warm waters should not be viewed as an abnormality.

Many rivers in the Pacific Northwest have been historically warm. NWPPA refers to historically warm rivers as those for which an extensive historical record is available of recorded temperatures exceeding the recommended numeric criteria in the RTG 2nd draft for a particular salmonid lifestage(s). The data from the past seventy years for the major rivers is remarkably consistent in result and shows historic temperatures very similar to those observed today. Some of the data is from periods of time when human alteration to the landscape was fairly minimal and thus the recorded temperatures could be considered natural temperatures or very close to natural. NWPPA believes that it is a mistake to assume that the mere fact of human activities (other than the construction of dams) means an altered temperature regime. There are, as EPA 10 notes, many factors that influence temperature; but guidance does not go far enough in acknowledging that these factors vary in influence in different situations. For large mainstem rivers, the primary determinant of water temperatures is the tendency of the water to come into “equilibrium” with air temperatures and after a certain point, temperature of the water tracks with ambient air temperature changes and little else. For smaller tributaries, the equilibrium concept applies, but may be working a little differently as the tributaries experience both warming and cooling over their length as they “seek” equilibrium. The concept of

equilibrium temperatures has been described in materials submitted by the forestry associations in the first round of comments and is well documented in EPA literature sources.

Recommendation:

The RTG 2nd draft should be revised:

- To acknowledge the known specifics of historically warm waters.
- To correct the description of temperature equilibrium for rivers.
- To remove the implication that states should consider mainstem rivers with historically warm temperatures as impaired when in fact they may have simply reached equilibrium.

Supporting Discussion:

1. Columbia/Snake Rivers

A paper titled “Summary of Information Relating to Historic Temperature Conditions of the Columbia and Lower Snake Rivers,” Paul Wiegand, NCASI (November 2002) is included as attachment A. This paper reviews sources of historic temperature data. The following is an excerpt:

Washington State water quality standards for the Columbia and Snake Rivers prescribe a limitation on the degree to which human-caused impacts may increase water temperatures when the natural temperature of the rivers exceeds 20°C. This aspect of the standard requires an understanding of the potential for the river to exceed 20°C due to natural or non-human causes. Specific procedures for determining “natural conditions” have not been formalized, though several studies have attempted to create a profile of river temperatures which occurred prior to significant human impact in the region. These studies have focused on analysis of historic recorded water temperatures measured in the Columbia River and lower Snake River prior to the installation of most hydro-electric or irrigation impoundments (dams), and estimation of natural temperatures using computer models of the unimpounded system (i.e., modeling with the dams removed). It is the purpose of this paper to summarize the findings of these studies and show that **the Columbia River and lower Snake River have typically exceeded 20°C due to natural conditions.**

2. Willamette River

The Oregon Department of Environmental Quality has listed the lower Willamette River as impaired for temperature, although the supporting data is not dissimilar from the data over the past seventy years when temperature recordings were reported. This listing of impairment is a prime example of basing decisions primarily on numeric criteria for fish needs without adequate consideration of the physical properties of the river, including the tendency of the river to come into equilibrium with air temperatures. A TMDL process is now underway which may more conclusively establish an appropriate temperature standard for this river.

The specifics are as follows. The Willamette below river mile 54.8 exceeds the current state temperature criteria of 68°F and above river mile 54.8 exceeds the 64°F criteria. The historical data indicates high temperature values above 80°F in both the lower and upper river with summertime values in the 70s for weeks at a time are not uncommon:

- “A Sanitary Survey of the Willamette Valley,” by Rogers et al. Engineering Experiment Station Oregon State Agricultural College Bulletin Series, No. 2 (June 1930) citing 1929 data for August showing 7 days of averages over 22°C; 6 days of averages of 21.1°-21.9°C; etc.
- “A Sanitary Survey of the Willamette River from Sellwood Bridge to the Willamette River,” by Gleeson Engineering Experiment Station Oregon State Agricultural College (1936) found similar values in September.
- “Report on Water Quality and Waste Treatment Needs for the Willamette River,” Oregon State Sanitary Authority (May 1964) cites temperature data for the period 1953-1963 showing monthly averages routinely exceeding 20°C and monthly averages reaching as high as 23°C.
- *The Return of a River – The Willamette River*,” by Gleeson, Advisory Committee on Environmental Science and Technology and Water Resources Research Institute, Oregon State University (June 1972) p. 36-37 notes: “Over the years, the average temperature of the river has not changed in an amount that is significant when compared to the large fluctuations which occur between maximum and minimum...with temperatures being somewhat less in the upper reaches and somewhat higher in the lower reaches...River sampling data were reviewed for thirteen different years covering the period from 1929 through 1970. In all of the thirteen years and at river flows as high as 9,900 cfs Salem gauge, temperatures in excess of 70°F were encountered at one or more river stations. Records indicate that periods as long as 2.0 days above 70°F may be expected at some locations on the mainstem of the river. Higher temperatures are encountered in the tributaries...Under conditions of regulated flow and with a flow of 8,000 cfs Salem gauge (9,470 cfs Portland Harbor) for the month of July, the river may be expected to reach 70°F as a mean temperature in the Portland Harbor and may reach a maximum of 78°F. Under the same conditions, the mean temperature of the river will exceed 65°F as far upstream as the Long tom tributary, at approximately 147 miles from the mouth.”
- Numerous other publications of this nature can be found in DEQ archives and NWPPA files.

NWPPA suggests that EPA’s assumption that rivers with impaired landscapes experience warming trends should be questioned in the case of large mainstem rivers such as the Willamette. Clearly, for the Willamette Valley there is far more development today than at the beginning of the century, yet river water temperatures today resemble those found seventy years ago. As discussed in the next section, the tendency of mainstem rivers to come into equilibrium with air temperatures is likely the more important factor.

3. Equilibrium Temperatures of Rivers

Much has been previously submitted for the record, which EPA should re-review. NWPPA also has additional information that may be relevant. This information

includes the results of extensive temperature monitoring on the Columbia River, White/Stuck Rivers in Washington and the Willamette River in Oregon.

(a) Columbia and White/Stuck Rivers

NWPPA is in the process of finalizing a report requested by the Department of Ecology (Ecology) which shows ambient river temperatures on the mainstem of the Columbia and White/Stuck Rivers tracking with ambient air temperatures.

Ecology requested a two-year temperature study to be conducted by Boise Cascade, Georgia-Pacific, Longview Fibre, and Weyerhaeuser on selected segments of the Columbia River and by Sonoco on a segment of the White/Stuck River. The purpose of the study was to determine if these rivers segments were appropriately included on Ecology's 303(d) list. The study was to be a simultaneous requirement of the NPDES permits for these mills; however not all of the NPDES permits were finalized at the same time. Nevertheless, given the complexity and costs of the study, the mills elected to pursue a collective response so that Ecology could approve a combined study plan and data from the same years (2002-2003) would be collected. The pulp mills contracted with Parametrix to perform the study. A reconnaissance survey was conducted in the summer of 2001 to determine appropriate locations for the temperature monitoring stations to comply with Ecology's Water Quality Policy 1-11, *Assessment of Water Quality for Section 303(d) List*. The Quality Assurance/Sampling Plan was prepared and approved by Ecology on April 12, 2002. During the summer of 2002, temperatures were continuously monitored at the approved locations. The contractor for the project, Parametrix is in the process of compiling the report for the first year (2002) sampling period, which NWPPA will submit for the record shortly. Attachment C includes the Executive Summary and Data Appendices.

(b) Willamette River

NWPPA is submitting for the record a report on the results of river temperature monitoring for the Willamette River for 2001-2002. NWPPA contracted with SECOR to conduct monitoring pursuant to a monitoring plan designed by the Oregon Department of Environmental Quality (DEQ) to provide data for the Willamette River TMDL effort. Attachment C is the data summary of the monitoring stations sponsored by NWPPA.

The study is relevant to EPA's RTG 2nd draft in a number of key respects.

First, the data shows the temperature profile of the Willamette River during a year of historically low flows, 2001, did not differ significantly from a year of more normal flows, 2002. This suggests that for this river, the equilibrium concept is an important factor, and perhaps overriding factor in determining river temperatures.

Secondly, the RTG 2nd draft offers the suggestion to states to include an exemption for unusually warm air temperatures. The data suggests that in the case of a naturally warm mainstem river which has reached equilibrium with ambient air temperatures, the warm weather exemption is not likely to offer relief even in a situation where one would expect the exemption to operate; namely, extremely low flows during the summer. The reason, again, is that it appears that air temperatures in the Willamette Valley in the summer are high and the river reaches a point of equilibrium.

B. Role of Alluvial Gravel /Groundwater (hyporheic flow) and thermal refugia

Issue:

Introduction of an insufficiently developed theory to support regulatory requirements.

The RTG 2nd draft (pages 5 and 6) introduces the idea that two forms of groundwater are no longer providing cool water to moderate summertime temperatures. First, that alluvial gravels no longer provide groundwater created during overbank conditions. Secondly, that exchange between the river and the riverbed (hyporheic flow) is no longer plentiful. Therefore in the recommendations, the RTG 2nd draft (page 30) directs states (when using natural background conditions as a basis for water quality standards) to set TMDL targets and TMDL allocations to protect alluvial river segments that would have provided cold water refugia prior to human alteration of the landscape. Further, the RTG 2nd draft suggests that states should include a rough or quantifiable estimate of the effect on temperatures if these areas are restored.

There are a number of problems with both the theory and the recommended actions. First, the explanation of the theories of impaired alluvial gravel and hyporheic flows appears to be derived from the Coutant paper ³. The paper in its entirety discusses many processes that may affect temperatures of the thermal landscape. Most of the discussion appears as a compilation of general hydrological and ecological principles that may be operate to varying degrees. However, the Coutant paper offers no empirical evidence quantifying these concepts for the Pacific Northwest landscape.

Secondly, the two concepts EPA introduces are vague. The word “hyporheic” means “under river,” and the “hyporheic zone” is usually defined as the subsurface area where groundwater and stream water mix. As to alluvial recharge, it is not clear if EPA means the groundwater that enters the river

³ “Perspectives on Temperature in Pacific Northwest’s Fresh Water,” Charles C. Coutant June 1999, Oak Ridge National Laboratory.

through the hyporheic zone or something else entirely, like smaller gravel beds associated with braided rivers. It just isn't clear what EPA is driving at.

Thirdly, as is often the case when empirical studies are performed, we may find the facts differ from theory or that alternative theories apply. For example, the groundwater recharge area of the Columbia River is the entire Columbia Basin and other large rivers also have extensive alluvial valleys. On this scale, we may find differences or countervailing factors offsetting the effects based on general theories. For instance, one must question the idea in the RTG 2nd draft that groundwater recharge is no longer plentiful in these areas, absent a showing the water table has dropped.

NWPPA also questions the concept that hyporheic flow from the Columbia riverbed to the river water is impaired. During the course of our 2002 summertime temperature monitoring of the Columbia River, one thermistor became buried in the sediments and produced very cool temperature readings. The data from the buried thermistor is included in the attachments as table D-1 of the Parametrix data appendices. The data shows sediment temperatures on the lower Columbia starting at 15-16°C in the early summer and rising to 19°C during a warm period in late August. The earlier reconnaissance survey found no nearby cold water refugia. This data suggests that the hypothesis of the role of hyporheic flow on the Columbia is ripe for testing. However, it is not technically defensible to simply assume at this point that it is impaired.

Similarly for the Willamette river, there is limited information on hyporheic flow; however the available information suggests hyporheic flow is quite plentiful and contributes a large portion of water during the summer. In 1993-5, USGS conducted a study to estimate water routing in the Willamette River and tributaries. Included is a discussion and modeling of groundwater gains and losses through the hyporheic zone at various points and times along the mainstem and major tributaries. The report is included as Attachment E.

Lastly, and most importantly, not only is there a lack of quantifiable information to support the theories offered by EPA in the RTG 2nd draft, there is a lack of established models or techniques to provide specific information for states to use. Model algorithms that simulate implied water exchanges between the river and river gravels are not yet available. At this stage of our understanding, it would be impossible for a state to comply with the directive to estimate effects on temperature if alluvial gravels or hyporheic flow is "restored."

Recommendation:

The RTG 2nd draft should be revised:

- The theories of alluvial gravels and hyporheic flows should be identified as theories or should be removed from the document completely.
- While it is appropriate to protect cold water refugia, EPA should not base regulatory recommendations on what may be the next generation of scientific theories. Before these theories are the basis for action, EPA needs to establish their existence in fact and develop tools to quantify them.
- EPA should not use these theories as a barrier to state action to base water temperature criteria on natural conditions where there is historical documentation of warm temperatures, particularly in large mainstems with extensive historical data.

C. Uncertainties Regarding the Scientific Literature of Temperature Needs of Salmonids Versus Actual Conditions in the Environment

Issue:

The RTG 2nd draft understates the uncertainty involved in deriving numeric criteria for salmon.

The RTG 2nd draft quotes a variety of sources and scientific literature as a basis of its description of the temperature needs of salmon and how human-caused changes have elevated water temperature and contributed to salmonid decline. This is an important body of knowledge offering empirical data and theories to help us understand this issue. NWPPA does not see its role as second-guessing this scientific work; however, NWPPA is of the opinion that an important point has been lost.

NWPPA respectfully suggests that the RTG 2nd draft overstates the certainty with which we can draw conclusions from this body of literature and thus the certainty with which we can derive policy decisions.

Most of the literature sources and federal agency analysis quoted in the RTG 2nd draft contain appropriate statements of uncertainty in their original text. Also, some of these same agencies noted their uncertainty in the process of reviewing literature sources for the purpose of the Biological Assessment conducted in 1999 as part of EPA's review of the Oregon Triennial Water Quality Standards Revision of 1992-4.

Supporting Discussion

During the course of its last effort to revise its temperature water quality standards (1992-4 Triennial Review), the Oregon DEQ was aware of the scientific uncertainties in attempting to find an ideal numeric criterion. The Environmental Quality Commission decision package notes at Page 7:

“Policy Advisory Committee members agreed that the standards should “fully protect” beneficial uses. However, the exact definition of full protection remained to be identified for each standard. Because for the standards under review there is no clear threshold below which beneficial uses face no risk and above which catastrophic impacts occur, there is not a single numeric value which can scientifically be considered the absolute *best* value (emphasis DEQ’s).

One of EPA 10’s experts acknowledged this issue for the purpose of EPA’s Biological Assessment of the proposed Oregon water quality standards:⁴

“Although the biological basis of these (often laboratory based) numerical standards for protection of salmonid life stages is believed to be generally robust, both standards and remedial measures need to be applied and interpreted in light of current understanding of the biological and ecological functions of the ecosystem and the ways in which water temperatures vary.” Coutant P. 1.

“One disconcerting feature of the literature is a lack of complete agreement in numbers presented. A search for *the* lethal temperature for Chinook salmon, for example, will yield a range covering a few degrees. These differences are probably all functions of the studies more than the inherent capacities of the fish. Each author has interpreted his or her data or experience somewhat differently. Experimental designs differ...The lesson is that we should not argue about decimal points but be content with a weight of evidence for each critical temperature being summarized. There may be value in selecting the most stringent of the alternatives, but we should recognize that errors can occur in both directions from the true value (a colder value may not be any better representation of the true value than a warmer one).” Coutant P. 68.

Both USF&WS and NMFS echoed Coutant’s concern in expressing caveats to their respective analyses in their Biological Opinions:

“He states that there is abundant, generally robust technical literature that defines suitable temperature ranges for various life stages. However, these findings are often laboratory based and not interpreted in light of current understanding of the biological and ecological functions of natural water temperature fluctuations. Temperature effects in the environment are much more complex than represented by most numeric limits. Much of the published literature reports results of laboratory studies which are limited in scope, reflecting only certain of the aspects of the species physiological requirements. Also, studies are conducted in a very limited context without the diversity and variability found in natural habitats. Consequently, comparing the laboratory results to expected results in a natural ecosystem is challenging, especially when using this information to develop a water quality standard.

When numeric standards are applied in combination with narrative and antidegradation standards, protection to the aquatic ecosystem may be much greater than any standard in isolation. The state has taken a progressive approach in setting a narrative temperature standard.”⁵

⁴ EPA letter to NMFS transmitting EPA’s Biological Assessment and requesting initiation of formal consultation. EPA appended to the BA a paper prepared by Coutant previously cited.

⁵ U.S. Fish and Wildlife Service letter July 1, 1999 to EPA X transmitting its Biological Opinion in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.).

“Most studies that have evaluated the response of salmonids to temperature are laboratory studies, and the majority of these experiments used constant, rather than fluctuating temperatures. Although these studies are instrumental to understanding the effects of temperature on salmonids, extrapolating laboratory results obtained using mostly constant temperatures to natural populations, which are subject to fluctuating temperatures, introduces considerable uncertainty.”⁶

⁶ National Marine Fisheries Service Biological and Conference Opinion “Approval of Oregon Water Quality Standards for Dissolved Oxygen, Temperature, and pH” issued July 7, 1999.

III. Implementation Issues

Issue:

Allowance for de minimus temperature increases as defined by 0.3 °C at the edge of a mixing zone or cumulatively in naturally warm waters.

The first draft of the RTG appeared to take into account some type of de minimus temperature increase for human activities. This concept seems to be omitted from the RTG 2nd draft. It is important that states be able to allow some type of de minimus level of warming in the following circumstances:

- when natural conditions cause temperatures to warm above the water quality criteria;
- when irreversible human effects (alone or in combination with natural conditions) cause temperatures to be above the water quality criteria; and
- at the edge of authorized mixing zones.

It is fairly common for state water quality standards in the Pacific Northwest to specify a numeric criteria which operates as a ‘signpost’ for the regulation of human sources of heat. This is a useful approach in situations where the correct numeric criteria is not known, but where it is known that natural conditions cause the specified criteria to be exceeded. Typically the allowance is 0.3°C (Washington) or 0.25°F (Oregon) or an equivalent formula and applies to cumulative increases in a particular segment when the criteria is exceeded for natural or a combination of natural and human caused conditions.

The allowance for de minimus increase is also typically applied by the states to the edge of mixing zones at all times. NWPPA studies have shown that the allowance for the de minimus increase at the edge of the mixing zone is compatible with the cumulative allowance when the criteria is exceeded. The reason is that heat from point sources on mainstem rivers dissipates rapidly and is not cumulative. Virtually all point sources are located on mainstem rivers.

Recommendation:

The RTG 2nd draft should be revised to include the concept of de minimus allowances:

- when natural conditions cause temperatures to warm above the water quality criteria;
- when irreversible human effects (alone or in combination with natural conditions) cause temperatures to be above the water quality criteria; and
- at the edge of authorized mixing zones.

Supporting Discussion:

NWPPA is submitting for the record a report by Parametrix (described above) which includes the results of monitoring of segments of the Columbia and White/Stuck Rivers in the summer of 2002. Monitoring was conducted upstream and downstream of the pulp and paper mills on these rivers. Although the pulp and paper mills are allowed 0.3°C increase at the edge of their mixing zones, the results show that the mills did not cause a 0.3°C increase in the river segments as a whole. The data analysis supports the following conclusions:

- The water temperatures continuously monitored within each of the four river segments are homogenous as demonstrated by the fixed temperature monitoring results and supported by temperature profiles. The river transects are fully mixed top-to-bottom and side-to-side except for near shore warming in a shallow area in one situation.
- The seven-day average maximum daily water temperature fluctuated across each of the three Columbia River segments. Wallula, Camas, and Longview segments did not exceed the allowable 0.3°C rise in water temperature when the upstream river temperature exceeded 20°C in accordance with Ecology's 303(d) testing policy procedures.
- The seven-day average maximum daily water temperature fluctuations across the White/Stuck River did not exceed the allowable 0.3°C rise in water temperature when the upstream river temperature exceeded 18°C in accordance with Ecology's 303(d) listing policy procedures.
- The slight fluctuations in temperature (plus and minus) that occurred across each segment (upstream/downstream transect) are attributed to and influenced by a combination of characteristics as listed below:
 - Travel time between upstream downstream transect at each segment.
 - Physical characteristic of each segment that included:
 - size and location of the tributaries entering the segment
 - solar radiation
 - surface area of the segment
 - tidal conditions

Issue:

Specific recommendations for mixing zones needs a slight adjustment.

NWPPA appreciates that the RTG 2nd draft contains a number of recommendations to protect salmonids from the potential adverse effects that may result from temperature mixing zones. These recommendations appear to be generally derived from scientific literature pertaining to mixing zones. NWPPA has concerns with some of the technical details.

NWPPA wishes to comment on the recommendation that *“temperatures at the edge of a zone of initial dilution (ZID) could be limited to 32°C and limited in size such that fish would not be entrained in the ZID for more than 2 seconds.”*

This recommendation appears to be based on information previously submitted by NWPPA during the first round of public comment (CH2MHill Diffuser Study). NWPPA wishes to clarify that the diffuser study was based on modeling of diffusers for large point sources and the dilution that is technologically possible for such sources. Generally warm temperatures will dissipate within 2 seconds and within 2 meters. Plume dynamics are such that fish are unlikely to become entrained. Consequently the actual potential exposure to temperatures of 32°C is minimal.

NWPPA offered a review of scientific literature on the upper incipient lethal temperatures for salmonids which suggests that exposure to 25°C for time periods on the order of hours are required before mortality to salmonids results.

NWPPA is unaware of any studies showing instantaneous lethality at exposures to 32°C for 2 seconds. Hypothetically speaking, exposures of 3 or 4 seconds may make no biological difference to salmonids.

NWPPA makes this point because although large point sources with well-designed diffusers should be able to meet the recommendation, there may be smaller sources for which longer exposure times would be acceptable. NWPPA would prefer that EPA acknowledge that the basis of the recommendation is technology not biology in order to offer permit writers a bit of flexibility if needed.

Issue:

The RTG 2nd draft identifies appropriate tenets for states to consider in narrative water quality standards applicable to mixing zones. However, the RTG 2nd draft is too prescriptive as each situation is site-specific.

Recommendation:

The RTG 2nd draft should

- Identify basic tenets for protecting salmonids.
- Delete the word “specific” (or replace with word “narrative”) in the first sentence of second paragraph on page 28.
- The third paragraph should be eliminated.

Supporting Discussion:

EPA has been responsive to prior comments regarding the inappropriateness of prescriptive *Temperature Management Plans* by removing this discussion in the current draft temperature guidance. However, the discussion in Section V.3 of the current guidance suggests that states add specific mixing zone provisions to water quality standards for the protection of salmonids. While the tenets given as narrative provisions in the second paragraph of this section (e.g., . . . ensures that mixing zones do not cause: instantaneous lethal temperatures; thermal shock; migration blockage; . . .etc) are appropriate, EPA’s implied requirement to extend these narrative provisions to specific, one-size-fits-all, numeric exposure time and temperature provisions (see third paragraph, Section V.3) is not reasonable because it does not recognize the need to consider site-specific conditions when establishing mixing zones.

Comments submitted on earlier drafts (see NWPPA comments on RTG 1st draft) demonstrate that the combination of unique stream characteristics (stream flow velocity, depth and width profile, etc), discharge configuration (existence of a diffuser, number of ports, jet velocity), and local site ecology creates a site-specific discharge scenario. The examples cited in the third paragraph of Section V.3 suggest that state water quality standards should have numerically specific thermal water quality standards for mixing zones. In fact, the examples themselves serve to illustrate that a one-size-fits-all approach incorporated in state water quality standards does not allow for full consideration of potentially important site-specific factors. The first example suggests that some fish may be unable to tolerate a 32°C temperature for more than 10 seconds, and then goes on to suggest that ZIDs might be sized to allow such temperatures to occur for less than 2 seconds. Another example suggests that the “cross-sectional area” of a stream exceeding 21°C should be limited to 25% to allow migration. In both cases, the selection of numeric standards (2 seconds and 25% of stream cross-sectional area) is arbitrary. Perhaps more importantly, however, neither considers the appropriateness of these standards for the physical profile, hydrology, and ecology of the stream segment in

which they will apply. For example, states may wish to consider the avoidance behavior of many fish species and conclude for a particular site that resident fish would be unlikely to be impacted by zones in a stream that may exist for longer than 10 seconds. Similarly, the referenced 25% of a stream's width that may exist at 21°C may in some circumstances be too large if that zone exists in the area of the stream most utilized during migration. For these reasons it is unrealistic for EPA to expect states to make *de facto* judgements concerning numeric thermal standards necessary to provide reasonable protection of aquatic life within mixing zones without the ability to impart site-specific considerations into that judgement. EPA's guidance would be better served with narrative recommendations concerning the protections that should be provided.

November 26, 2002

John Palmer
EPA Region 10
Mailstop: OW-134
1200 S.W. 6th Avenue
Seattle, WA 98101

Subject: Review of *"Draft EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards (2nd Public Review Draft, October 10, 2002)"*

Dear Mr. Palmer:

The Oregon Forest Industries Council (OFIC), on behalf of industrial forest landowners in Oregon, submits the attached comments to EPA for the agency's consideration. We appreciate this opportunity to comment on the proposed temperature guidance (2nd Draft). We believe that EPA has significantly improved the document, but there are still several issues that we feel have been mischaracterized and several remaining opportunities to assist the states and tribes (states) in proposing credible, defensible water temperature standards.

OFIC would like to point out that the temperature guidance is expected to be exactly that: *guidance*. This EPA project is not the forum for waging final technical arguments or definitively answering all questions. The document, to be truly useful, should set out to define the decision space for States, not the decision itself. However, the current document format is inconsistent in attempting to guide, then decide, then guide again. Advancement of specific numeric criteria is deciding—proposing acceptable ranges of numbers is guidance.

Our comments mainly address policy and technical aspects of the 2nd Draft. There are significant legal questions that still remain. We would point you to qualified commenters in the field of Clean Water Act law for those issues. We would like to reference comments made by the Washington Forest Protection Association, the Intermountain Forest Association, and the State of Oregon. In addition, OFIC would like to direct your attention to comments made by our member companies and their scientists—many of our members have considerable technical expertise when it comes to fish and fish habitat. OFIC believes that in total these comments will be extremely valuable to EPA in crafting a final document that will be helpful to the States during the development of their proposed temperature standards.

While we have many issues that will be discussed in the attachment to this letter, we would like to highlight several issues for EPA's consideration:

- The process used was inherently flawed. The public was disenfranchised from the process by not being allowed to participate fully. We understand that many State

participants expressed frustrations that the process did not meet the needs of the States. Terms like “peer review groups” and “expert review panels” were used when it is clear that true “peer review” was used sparingly. These observations are provided here as examples of a process that reduced instead of built trust in the final product.

- EPA makes reference to an “expedited” review during consultation if States would choose this approach. Yet this review is totally unassured. A vague reference to “expedited” review could be interpreted to mean that a higher level of scrutiny will be applied to a product submitted by the States that does not use this approach. EPA should commit, and the Services as well, to a thorough yet timely review of any submittal package, regardless of whether it follows this guidance. The States should expect nothing more or less.
- EPA seems to assume at least two things in the guidance with which OFIC disagrees. First, one must accept that temperature is a problem. Not just a small, localized problem, but a landscape level, population threatening problem. While the technical papers demonstrate that temperature is a problem some times in some places, the connection between actual at-risk fish *populations* (not individual laboratory fish) and temperature is weak. Similarly, EPA does not demonstrate technically why national 304(a) criteria are insufficient. Vague references to sublethal or chronic effects does not demonstrate the inability of the national criteria to protect these fish. The guidance should not be directed at preventing effects that have not been shown to occur with rigorous, scientifically credible research studies.
- EPA maintains it has chosen numeric criteria “near the warm end of the optimal range,” yet this assertion cannot be independently verified. Picking a number based on a preponderance of laboratory data and “adjusting” it a few degrees to account for variable temperature regimes that fish actually experience is unacceptably arbitrary. OFIC accepts that the interaction of variable temperature regimes, duration of fish exposure to suboptimal temperatures, and fish behavior is a complex problem. Simply asserting that EPA has chosen a number near the warm end of optimal without exploring these complexities is unsubstantiated.
- Moreover, EPA's hypothesized “worst case scenario” (i.e., low flow, low food, higher than optimal temperatures) that leads to given criteria is not ecological fact; another equally valid hypothesis is that the worst case scenario is an acceptable condition for the period. This latter hypothesis would suggest that fish are exposed to optimal temperatures during other periods, thus maximizing growth and vigor when food is readily available. EPA must eliminate its “colder is always better” mantra and accept that optimal temperature ranges mean that water can be unfavorably warm **AND** undesirably cool at times throughout the life cycle of salmonids.

- After multiple rounds of comment and discussion about these topics, EPA still misrepresents many physical processes. Page 6 of the guidance discusses the old but incorrect adage that forest harvesting affects groundwater storage and therefore lowers stream flows. Actually, the correct interpretation is that harvesting increases summer low flows due to decreased levels of evapotranspiration. While the affect is minimal and short-lived, tree removal actually increases base flow at the most sensitive times.
- Similarly, on page 28, EPA mistakenly asserts that upstream temperatures will "play a critical role in maintaining temperatures downstream." EPA continues to misunderstand the equilibrium temperature concept. While it is true that release of cool reservoir water will result in persistent cooler temperatures some distance downstream of the dam because reservoir outputs are large relative to riverflow, smaller streams (and larger rivers without dams) are always seeking an equilibrium temperature that tracks the ambient air temperature. Significantly changing water temperature at some point upstream simply changes how quickly the water warms or cools to the equilibrium temperature downstream.
- EPA misses an opportunity to investigate temperatures at the landscape scale. EPA has chosen to ignore the *Sufficiency Analysis* recently developed cooperatively by the Oregon Department of Forestry and the Oregon Department of Environmental Quality. This analysis provides insight to productive ways for discussing temperature at the landscape scale.
- EPA correctly begins to discuss handling streams that do not now, and probably cannot ever, meet the numeric criteria. In fact, EPA cites many places where its suggested numeric criteria will not be met. Unfortunately, engaging EPA's suggestions for these "offramps" are expensive and analytically challenging. As a matter of good public policy, why would a state propose a standard that routinely does not apply? If these conditions are common, then the offramps should be easy to use. EPA's guidance should focus on making flexibility the key so that a State may adopt a standard that applies virtually everywhere. That would relegate these offramps to only sporadic use, if at all, instead of them being the norm. If these offramps are needed, then they should be easy to use. Oddly, from a landowner's perspective EPA's suggested guidance appears to favor operations near impaired waters, and would penalize those who operate near waters attaining the standard. Government should seek to reward those who have historically taken actions to keep water at or above water quality standards, not penalize them.
- EPA has missed a chance to define what elements would be proper for a State to include in a Standards "submittal package." Many elements of existing State programs are appropriate supporting material upon which EPA can rely when approving a State standard, yet EPA has chosen to list only some programs and not others. The list should be deleted in favor of identifying which elements are appropriate for inclusion and why.

In summary, OFIC would recommend the following:

1. EPA should fully recognize the roles and authority that States possess in formulating water quality standards. Not just in statement, but in meaning. EPA should not preclude opportunities for states to construct water temperature standards that deviate from EPA recommendations but are in fact grounded in local knowledge and credible science. Nor should EPA suggest in its guidance so many facets of a standard that the States are effectively precluded from choosing the elements that are proper and eliminating the ones that are not.
2. The final guidance should only contain the elements that have sound technical merit. OFIC believes that numerous technical errors and misrepresentations of biological and ecological relationships significantly weaken the guidance and either need to be corrected or deleted.
3. EPA should recommend ranges of numeric criteria. Choosing single numbers have opened EPA to a never ending scientific debate about “the number.” In reality, no combination of scientific evidence points to one number vs. another. The final choice is one of *policy*, not science. Asserting that the choice is scientific invites counter productive debate. Fish thrive in a variety of water temperatures—EPA should simply recognize that.
4. EPA should recognize population ecology as well as single individual ecology. If one accepts that populations are at risk **solely** because habitat is “thermally degraded” and that suitable habitat has significantly shrunk because of that degradation, it makes sense for adjacent sub-optimal habitat to be “protected.” If, on the other hand, one looks at robust fish returns and hypothesizes that temperature has not been the driving force in fish declines but that ocean conditions and their variability have, one looks at adjacent suboptimal habitat as just that. Extant populations will always seek out better habitat. When that fills up, adjacent habitat will be used to the extent that the fish can utilize it. The populations will be viable, and the displaced, least-competitive fish will be in a situation that it has always been—potential elimination. EPA should seek to better understand (or accept from the States) a more complete discussion of the conceptual workings of population dynamics.
5. EPA should remove offending language. EPA provides us with many terms that have no accepted definition and provokes questions that the States will not be able to answer. What is a mainstem river? How would a State designate “core rearing” areas? The guidance appropriately does not go into detail on how to answer these questions, but that is only marginally better than leaving them as open-ended unanswerable questions. Further, dubious scientific statements like “thermally degraded,” “shrunk distributions” are used in value-laden statements that reduce the document's credibility. Terms that do not have quantifiable scientific definitions, and statements that are not supported by scientifically credible science, should be removed.

I hope EPA finds these comments, and our thoughtful discussion of these and other points in the attachment, helpful. I would hope that EPA would implement our suggestions. If I may be of any help in clarifying our comments, please don't hesitate to call.

Sincerely,

Chris Jarmer
Director of Water Policy and Forest Regulation

cc: John Iani, Regional Administrator, EPA Region 10
Randy Smith, EPA Office of Water, Region 10
Mark Charles, Oregon Department of Environmental Quality
Ted Lorensen, Oregon Department of Forestry

Attachment

Attachment 1

Oregon Forest Industries Council Review

of the *"Draft EPA Region 10 Guidance
for Pacific Northwest State and Tribal Temperature Water Quality Standards
2nd Public Review Draft, October 10, 2002"*

Oregon Forest Industries Council Review

of the *Second Draft EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards* (2nd Public Review Draft, October 10, 2002)

November 26, 2002

The following comments address the Oregon Forest Industries Council's concerns about technical and policy aspects of the *EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards* [2nd Draft]. Each comment contains a problem statement, supporting evidence of the problem, and actions requested.

EPA does not use a consistent definition for temperature optima.

Supporting Evidence: Throughout the 2nd Draft, optimum temperature is variously referred to in the contexts of growth, disease, competition, survival, swimming performance, or health, or the context is not specified at all. Temperature optima are unlikely to be the same for the various performance indicators, even for a given species life stage. The Bull Trout Temperature Criteria Peer Review Panel undoubtedly recognized the need for a consistent definition of temperature optima, but could not decide on a common definition.

Furthermore, statistics for stated or assumed temperature optima are not given in the 2nd Draft. Without statistics that describe the relationships and ranges, the reader cannot determine whether the reported optimal ranges are biologically consistent or reflect consistent statistical confidence levels. The temperature optima need to be better defined if selected numeric criteria are to credibly and defensibly represent "the warm end of the optimal temperature range." Picking a number and referring to it as "the warm end of...optimal" is not convincing without credible and defensible risk assessment, based on statistically meaningful ranges of temperature optima. As a consequence, the numeric criteria thresholds that reflect temperatures near "the warm end of the optimal temperature range" cannot be independently corroborated.

Action Requested: Define what is meant by optimal temperature, and characterize the recommended numeric criteria quantitatively.

EPA's focus on single numeric values for recommended temperature criteria imposes artificial thresholds on naturally complex ranges of biological responses.

Supporting Evidence: States need information about the *ranges* of temperatures that are suitable for salmonids. By recommending temperature criteria ranges instead of single numeric values, EPA would acknowledge natural variability and continua of biological responses, while fostering flexibility and local adaptability. According to the scientific literature, which is summarized in Tables 1 and 2 of the EPA 2nd Draft, ranges of optima describe fish responses to temperature, not single numeric values. For example,

McCullough and Spalding (2002) stated, "the stream temperature that will support juvenile bull trout is not a single number but rather a range of numbers with associated risks to the fish."

By recommending temperature ranges, EPA would facilitate the application by states of risk assessment for formulating standards. Furthermore, it would provide a reasonable framework for accommodating dissenting opinions, such as those expressed by Don Essig and the Idaho Department of Environmental Quality and Mark Hicks and the Washington DOE in their responses to biological threshold numbers proposed by the Regional Temperature Criteria Development Technical Workgroup. Risk assessment, based on criteria ranges, would provide policy-makers with information for making decisions concerning tradeoffs among numeric criteria assigned to protect beneficial uses.

Action Requested: Ranges of temperature criteria should be recommended instead of single numeric criterion values.

The scientific basis for EPA's recommended numeric criteria is old and not representative of field conditions.

Supporting Evidence: The summaries of temperature considerations for salmon and trout that are used to support the suggested numeric criteria (i.e., Tables 1 and 2) contain important data gaps. Of 31 cited references for temperatures and units, 27 (90 percent) are based on results from constant-temperature laboratory studies using hatchery fish. Apparently, only two are based on average field temperatures. One is based on prolonged field exposures. And one apparently is an extrapolation of field temperatures from laboratory results.

Virtually all of the constant temperature laboratory studies were performed decades ago when our knowledge of proper fish holding (i.e., fish density and water exchange rates) and food requirements were poorly known. The laboratory fish probably were fed poor quality food and their diets were inadequate and incomplete nutritionally. Diets limited in quantity or quality stress fish. The lab fish probably were further stressed because they were overcrowded or had inadequate exchange rates of rearing water—conditions that lead to lower-than-desired levels of dissolved oxygen and higher-than-desired levels of ammonia and other waste metabolites. Too often in early lab studies, the temperature measurement of the holding tank and the temperature fish actually experienced were not the same. The early lab studies are the limited bases of knowledge of the possible relationships between temperatures, growth, and survival of salmon. These studies underestimate the adaptability of fish under field temperature conditions.

On the other hand, more recent studies employed a range of food rations (i.e., volume and quality), lower fish densities, high exchange rates of water, evaluated competition with brook trout, and examined the effects of fluctuating temperature regimes (e.g., Selong et al. 2001; McMahon et al. 2001; Weber et al. 2001).

Action Requested: The early constant temperature laboratory studies very much need to be reanalyzed so that greater weight is placed on studies and results that are most relevant and that can be extrapolated to the real world. EPA should not base their recommendations on the imperfect older science.

EPA has not justified their recommended numeric criterion for juvenile rearing of bull trout.

Supporting Evidence: We understand that EPA proposed a 13°C criterion for bull trout juvenile rearing on July 9, 2002, which the agency supported by multiple lines of evidence and scientific literature cited in previous temperature criteria comments to EPA by the Oregon Forest Industries Council (e.g., Selong et al. 2001; McMahon et al. 2001; Weber et al. 2001). Yet the 2nd Draft recommends a value of 12°C. It is unclear and apparently undocumented how the EPA shifted from its 13°C "straw" proposal to its 12°C 2nd Draft recommendation.

The shift in EPA's recommendation seems unsupported by the findings of the Bull Trout Temperature Criteria Peer Review Panel, which were summarized by Chris Myrick after the Panel convened on August 1, 2002. The Peer Review Panel, which apparently was an extended EPA Technical Workgroup rather than a truly independent group of peer reviewers, concluded that it had "no means of quantifying the level of risk" among criteria ranging from 12°C to 16°C. It appears that the best that the Peer Review Panel could do was assign relative risk levels to the criteria range (i.e., risk decreases as the temperature criterion decreases), rather than assign absolute levels of protection. Consequently, it remains unknown whether bull trout would experience a significant benefit from lower temperature criteria selected from within the optimal range.

The only document supporting EPA's recommended 12°C criterion, *Multiple Lines of Evidence for Determining Upper Optimal Temperature Thresholds for Bull Trout* by McCullough and Spalding, apparently did so because its authors elected to emphasize "studies that are available as final manuscripts rather than progress reports." A concern is that the authors selectively used the scientific literature to justify a "protective approach." The *Dissenting Opinion on Biological Threshold Numbers* by Don Essig and the Idaho DEQ, and the *Draft Discussion Paper and Literature Summary* by Mark Hicks and Washington DOE present sound arguments for a warmer numeric criterion (i.e., 13°C) that would be near "the warm end of the optimal temperature range," yet protective of beneficial uses. Clearly, EPA's temperature guidance needs to consider and reflect all valid scientific proposals for numeric criteria. Otherwise, the recommended criterion runs the risk of being arbitrary.

Additionally and importantly, the 12°C value recommended by EPA appears inconsistent with the scientific literature summary reported in Table 2 of the 2nd Draft, even after cursory analysis.

Action Requested: Resolve inconsistencies among the EPA recommended numeric criteria, the values considered by members of the Technical Workgroup, the Bull Trout Temperature Criteria Peer Review Panel, and the scientific literature. Acknowledge that the "multiple lines of evidence" procedures are not ironclad and do not produce independently reproducible results. Avoid force-fitting a recommendation for a single numeric value when it cannot be supported by the scientific literature. Instead, provide ranges of acceptable criteria and confidence levels for associated risk; for example, EPA could recommend a range from 12 °C to 16 °C, with each state conducting risk assessments to determine local geographic standards. Consider refining the recommended criteria in the future through adaptive management.

EPA continues to misrepresent and misinterpret the equilibrium temperature concept.

Supporting Evidence: EPA's acknowledgement that streams naturally warm as they flow downhill is good. However, the 2nd Draft contains misleading generalizations such as, "protection of...cold water segments in the upper part of a river basin likely plays a critical role in maintaining temperatures downstream," and "if downstream temperatures are currently exceeding the numeric criteria, any upstream temperature increase will in many cases further contribute to the non-attainment downstream."

Stream temperatures are constantly adjusting to their environment. A release of cold water (e.g., from a reservoir) will lower stream temperatures for some distance downstream, but at some point the cold water release will have no further effect on the stream's temperature. At that point downstream, the stream temperature will be the same regardless of the slug of water. This is the temperature equilibration principle and it follows the Second Law of Thermodynamics. This principle is especially evident in low volume, headwater stream systems; however, temperature effects translate farther downstream in large rivers. References to pertinent scientific literature describing the temperature equilibrium principle were provided in previously OFIC comments to the EPA Region 10 Temperature Guidance Project.

It is interesting to note that the cool headwaters of the Tucannon River described by Theurer et al. (1985) appear to have little influence on the water temperatures downstream, which exceed optimal salmon rearing temperatures even under modeled "climax riparian vegetation."

Action Requested: Fix the misleading statements that describe temperature equilibrium principles.

EPA suggests that human-caused elevated water temperature is a major factor in salmonid decline, but fails to provide convincing evidence of its significance.

Supporting Evidence: A fundamental assumption of the 2nd Draft is that the current distribution and status of salmonid populations in the Pacific Northwest is related in some significant way to anthropogenic increases in temperature. However, the evidence presented by EPA is based on "listing and status reviews," "scientific advice," "initiatives," reviews, and models.

Two of the studies that EPA uses to describe the effects of riparian vegetation management on stream temperature and fish condition—Theurer and others (1985) and the Upper Grande Ronde TMDL—are modeling exercises. Their findings are as good as the models and the assumptions that were input into the models.

For example, Theurer and others compared temperatures under existing riparian conditions to various degrees of "climax riparian vegetation." Plant ecologists generally agree that the concept of "climax" is a theoretically obsolete characterization of dynamically changing Eastside riparian areas. Their modeled conditions may not be sustainable and may never have existed historically.

The other modeling study, Oregon DEQ's Upper Grande Ronde TMDL, was reviewed previously by the Oregon Forest Industries Council (Western Watershed Analysts 2000). The findings of our sensitivity review of DEQ's model are four-fold: (1) riparian buffers of site potential height, 30-meter width, and maximum canopy density are not necessarily required to meet water quality standards in tributary drainages of the Upper Grande Ronde basin; (2) riparian vegetation conditions can be selectively manipulated in tributary drainages without violating water quality standards in the tributaries and without affecting maximum water temperatures in the mainstem of the Grande Ronde; (3) ODEQ's methodology for determining site potential vegetative dimensions ignores the substantial variability of achievable conditions that are commonly found in forest riparian areas and is not a realistic representation of true forest conditions; and (4) the results of DEQ's procedure do not provide realistic achievable representations of potential effective shade because the assumed riparian vegetation heights are flawed.

In other words, empirical studies and causal evidence are lacking. We do not deny that human activities can and do affect stream temperatures, but the inference that the impacts are large, widespread, and ongoing is unfounded.

Action Requested: Provide a better, more accurate characterization of the strengths and weaknesses of the example studies, and explain the difficulties of demonstrating the causal linkages between human-caused temperature effects and salmon decline.

EPA's recommended temperature criteria do not acknowledge differences between appropriate optima for healthy individuals versus optima for healthy populations.

Supporting Evidence: Fish are naturally fecund. They evolved that way so that populations can persist among the suboptimal conditions that individual fish experience in Nature. Given the large numbers of offspring, not every individual fish would be expected to survive. It is unreasonable to expect that optimal conditions for listed fish existed historically, or could exist, across entire stream systems. Appropriate temperature criteria for fish populations should acknowledge that aquatic temperature conditions need not be perfect everywhere, and that fish exhibit behavior according to the "focal" temperature concept; that is, the water temperature experienced by fish in heterogeneous stream conditions often is cooler than the ambient recorded stream temperature (e.g., Berman and Quinn 1991).

We believe that it is appropriate for EPA, in its programmatic water temperature guidance, to develop guidance that is protective of fish populations and communities.

Action Requested: The recommended temperature criteria need to reflect fish population ecology, not just the health of individual fish. It is unreasonable to manage for optimal conditions for all fish.

Numerous factual errors are contained under the 2nd Draft heading, “Human Activities that Can Contribute to Excess Warming of Rivers and Streams.”

Supporting Evidence: This section attempts to link elevated stream temperatures with human activities. However, the section contains numerous inaccuracies and mischaracterizations of the human influence. The problem with the guidance occurred because information is portrayed out of context or because theoretical relationships are described without consideration for their prevalence or importance. For example, mechanism #2, the effect of vegetation removal on streambank stability appears to be theoretical and blown out of proportion to the potential effects. Another example is mechanism #5, which asserts the importance of overbank flooding to groundwater temperature and detention, overstates the contributions to river hydrology. Mechanism #6 is outright wrong and unsupportable by forest hydrology literature. And mechanism #7 should be conditioned with many caveats because its validity holds for only limited situations.

Action Requested: Correct the inaccuracies in this section by eliminating unsupported theoretical relationships, and focus on quantifiable problems of known significance.

There appear to be no real assurances that the states “can expect an expedited review by EPA and the Services” if the state WQS is consistent with EPA guidance.

Supporting Evidence: At a recent EPA public meeting, it became clear that NMFS and USFWS have offered no real assurances for “expedited ESA consultation.” For example, NMFS expressed that the agency will need to review all of the specifics in any state proposal. In addition to uncertainty about ESA consultation with the Services over state WQSs, there is uncertainty about ESA consultation over probable new proposals for revised beneficial use designations. EPA's recent experience with the Bull Trout Temperature Criteria Peer Review Panel is an indication that the Services may not be in alignment with EPA or the states.

Action Requested: Acknowledge that there is no guaranty for expedited ESA consultation.

EPA acknowledges the 304(a) national temperature criteria, but fails to adequately explain why the national criteria do not protect against chronic and sub-lethal effects. Why are the national numbers not protective?

Supporting Evidence: EPA conjectures that, for “vulnerable” Pacific Northwest ESA salmon populations, the sub-lethal chronic effects could “impact the overall health and size of the population,” but this assertion is not demonstrated in the 2nd Draft. Apparently, EPA believes that the depressed salmon population levels (and the ESA listings) are caused by fresh water impacts, including the conjectured chronic temperature effects. In order to be significant at a population level, the conjectured sub-lethal temperature effects would have to be very substantial—much greater than the temperature effects that salmon experience under naturally varying environmental conditions. EPA has not demonstrated that the degree of the temperature effects is substantial and greater than the effects caused by natural environmental variability.

This freshwater impact hypothesis was the belief of many fish biologists and environmentalists until the importance of changing ocean and related climate conditions were better understood. EPA acknowledges that Pacific Northwest salmon populations historically fluctuated from climatic, ocean, and other disturbances; however, the recent strong salmon returns in the Pacific Northwest that correspond to improved ocean and climatic conditions—natural environmental variability beneficial to salmon—have shown the weakness of the freshwater impact hypothesis. The purported human impacts to Pacific Northwest rivers and their temperature regimes still occur, but the salmon have returned now in abundance. Studies by NMFS, USFWS, and others did not anticipate this.

Action Requested: The 304(a) national temperature criteria are intended to adequately protect Pacific Northwest salmon, as they do protect salmon in other regions of the U.S. The importance of natural environmental variability and the ocean bottleneck is apparently greater than the importance of the purported human impacts. The numeric criteria should be revised to reflect this.

EPA should reconsider the desirability of recommending numeric temperature criteria for non-summer uses.

Supporting Evidence: Although EPA suggests that non-summer uses generally will be protected if recommended summer maximum temperatures are not exceeded (i.e., Page 17), Table 4 contains recommended numeric criteria for the non-summer period. We are concerned that the proposed temperature thresholds, which are based largely on lab studies and not field-verified, may not be attainable under many natural stream conditions. It would be extremely difficult to reduce temperatures at these times of year if the thresholds would be exceeded. Furthermore, certain species-life-stage uses can commence naturally prior to the onset of optimal temperatures for the use. For example, bull trout spawning can occur at warmer-than-optimum conditions when fish begin to perceive declining fall temperatures. By suggesting non-summer temperature criteria, we believe that EPA could create an artificial expectation and a costly regulatory framework for the states.

Action Requested: EPA should not recommend non-summer temperature standards, except to suggest that adequate non-summer temperatures would be attained if summer beneficial uses are adequately protected.

Recommendations for temperature standards that address naturally warm waters are confusing.

Supporting Evidence: We appreciate EPA's attempt to provide flexibility in addressing waters with naturally warm background conditions, but the suggested procedures are unclear and potentially cumbersome to implement. Most confusing are the recommended processes for states to approve variances in temperature standards, the differences among the variance procedures, and how to treat naturally warm water. A major concern is that the Oregon DEQ does not have adequate funding for the preparation of basin-specific temperature standards, particularly if credible standards would be formulated through Use Attainability Analysis (UAA) during TMDL processes. In addition to UAA, it appears that the ODEQ would be required to conduct ESA consultation on newly proposed beneficial use designations (in addition to the WQSs themselves). The EPA-proposed temperature

TMDL for naturally-high-temperature streams (i.e., eliminate all sources of human-influenced temperature effects) is untenable, and appears to be an artificial sideboard that EPA would seek to impose on Oregon's TMDL process.

Action Requested: These sections should be removed and the States should be encouraged to develop viable solutions.

The variance for 1-in-10-year temperatures is confusing.

Supporting Evidence: Exempting stream temperatures during obviously warm years is on the right track, but is confusing. If one accepts EPA's hypothesis that water temperature is already a widespread problem, ignoring temperature extremes during 1-in-10 years probably would kill the resident fish. If one accepts OFIC's hypothesis that temperature is a variable largely within the range of natural variation, this 1-in-10-year variance would be a natural suboptimal condition to which fish would be exposed. And they would survive.

From a practical standpoint, the proposed variance assumes 10 years of water temperature data, which almost never exists. Local air temperatures would be a better metric.

Action Requested: Clarify the range of natural variation that temperature profiles exhibit.

A mathematical error occurs in Table 4.

Supporting Evidence: In Table 4, the metric-English conversion of the steelhead smoltification criterion is incorrect: 14°C is 57°F, and not 61°F.

Action Requested: Correct the error.

Literature Cited

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Western Watershed Analysts. 2000. Evaluation of Shade Effects on Water Temperature of Tributaries and the Mainstem of the Grande Ronde River Using Oregon DEQ's *Heat Source* Temperature Model. CH2M HILL, Portland, OR.

**For further
information**

Please direct any questions to Chris Jarmer/Oregon Forest Industries Council at 503/371-2942.

November 26, 2002

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Subject: Review of “*Draft EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards (2nd Public Review Draft, October 10, 2002)*”

Dear Mr. Palmer:

I am submitting these comments on behalf of Plum Creek Timber Company. We request that our comments submitted on February 20, 2002 in response to the first draft of the EPA Region 10 Guidance for State and Tribal Temperature Water Quality Standards (October 2001) be included by reference in this round of public comment. Our comments largely focus on the technical basis and implementation aspects of the recommendations in EPA’s second draft guidance report (Draft Guidance II). We refer EPA to comments submitted by the Washington Forest Protection Association (WFPA) and the Oregon Forest Industries Council (OFIC) for comments that regard policy, legal, and other technical aspects of Draft Guidance II.

Plum Creek commends EPA for making substantive improvements in Draft Guidance II. On the whole the numeric criteria are better focused, more clearly described, and more reasonable to implement than in the original draft. EPA’s focus on peak summer temperatures for the juvenile rearing life phase as the primary basis for numeric criteria is credible. Choice of a consistent temperature metric (7DADM) for all numeric criteria and only one criterion per species/life stage is a sensible improvement that will greatly aid implementation. Tables 1 and 2, though lacking in detail, provide important guidance and links to reference materials that states will need when crafting their own temperature WQS.

Despite the improvements in Draft Guidance II, there remain significant deficiencies that we believe need correction before the guidance can fully assist the states in meeting their Clean Water Act (CWA) obligations. The main deficiencies continue to lie with the numeric criteria and their implementation. Specifically: (1) the bull trout rearing criterion is too low; (2) guidance on where criteria apply are inappropriate; (3) the criteria for species/life stages besides juvenile rearing are unnecessary; and (4) provisions for unusual weather and naturally warm background conditions are overly restrictive. These items are discussed below.

The Numeric Criterion for Juvenile Bull Trout Rearing Is Still Too Low

One of the most perplexing aspects of the Draft Guidance II is how EPA determined a 7DADM criterion of 12°C was *more adequate* than some other number in the range between 10°C and 15°C. This is particularly perplexing because three of the five proposals on the EPA website, *including one from EPA*, recommend a 13°C 7DADM. Our own information, provided in comments on Draft Guidance I, shows 13°C to be fully supportive of this beneficial use. Moreover, WFPA recommended 13°C in for this species/life stage in their comments to the Washington State Dept. of Ecology in 2001. In our view, the rationale provided by the states of Washington and Idaho were thorough and compelling. We are disturbed that EPA has adopted a more conservative criterion without clear, objective justification. This apparently arbitrary choice has profound regulatory implications.

In the peer review panel summary, there is only passing reference to the 13°C criterion and supporting material from the three papers. This is odd, given the stated goal of the panel to review these papers. On page 3 of the review, it is stated that: “*The peer review panel was unable to agree on a definition of optimal,*” and later: “*We would not recommend setting the temperature criterion higher than those presented here.*” (presumably 11°C 12°C and 13°C 7DADM?). Aside from the comment that “*The lower the proposed temperature, the lower the risk to bull trout populations and individuals, especially when they occur sympatrically with other salmonid species*”, readers are given no information for evaluating the merits or drawbacks of a 13°C criterion. From this comment, concern about competition appears to be one of the deciding factors used by EPA. This is hinted at again in the Draft Guidance II in the discussion of how alternative numeric criteria could be adopted if they were shown to support the designated uses. The Draft Guidance II appears to support “*adoption of a 13°C 7DADM criterion to protect bull trout rearing use in areas where competition with other fish is minimal and food resources are abundant*” (§VI.1, p. 29). If competition and food availability are EPA’s concerns, then it is worthwhile to examine the basis of these concerns.

Table 2 in the Draft Guidance II lists temperatures > 12°C as conferring a competitive disadvantage to bull trout. Readers are referred to Technical Issue Paper 1 (pp 21-23). In this paper it appears that this conclusion is drawn from the McMahon et al. (1999) work, where growth of bull trout and brook trout was studied in sympatry and allopatry. The text of the Technical Paper suggests that increasing temperature favors brook trout over bull trout. However, Figure 10 in McMahon et al. (1999) shows brook trout grow better than bull trout when the two occur together regardless of temperature (down to 8°C). These data do not support the notion that competition with brook trout can be significantly reduced or eliminated with a temperature standard less than 13°C.

In the proposal by McCullough and Spalding (2002), a study by Haas (2001) is cited as support for a 7DADM of 11.6°C to predict bull trout presence, numerical dominance, and higher condition factor in the face of competition from rainbow trout. However, this study should not be relied upon to provide conclusive evidence that bull trout populations fail to thrive where the 7DADM reaches 13°C when rainbow trout or other native salmonids are present. The study was not designed to directly test for competition, and

so the observed temperatures cannot be associated with the differences in dominance in a cause-effect manner. Importantly, the study only encompassed a single year, and therefore it is not known how the relationship between the two species would change in years with warmer, cooler, or average temperatures. Neither the concern for competition nor the temperature values that tip the competitive balance in favor or against bull trout can be reliably determined from these studies. They are certainly inadequate as a basis for a temperature criterion that is intended for application throughout the Pacific Northwest.

With regard to food resources, EPA must keep in mind that while it is generally recognized that Pacific Northwestern streams do not offer unlimited food to bull trout or other species, neither are bull trout populations at risk because of this. This is a natural feature of the local environment and fish densities, growth, and maturation rates have evolved to accommodate this. True, many streams do not presently receive the nutrient inputs they once did when salmon populations were large, but in the range of bull trout, there are many streams outside the range of anadromous salmonids that support healthy bull trout populations. Also, suggesting that bull trout require temperatures colder than 12°C 7DADM ignores the detrimental effects these colder temperatures can have on bull trout populations. We won't belabor this point---others have and will comment on the fallacy of the "colder is better" paradigm---but we will point out one risk to bull trout that we have not seen mentioned. When bull trout are relegated to the colder thermal environments, it takes them many years to mature (Mullan et al. 1992). Individuals in these populations are therefore exposed to stochastic and deterministic mortality agents for many more years than if they reared at warmer temperatures, which can conceivably result in reduced population fitness. This should be factored into quantitative risk assessments of temperature criteria for bull trout.

One final aspect of food availability that EPA may have overlooked is that temperature and food are not independent. In the forested streams of the PNW where bull trout rearing occurs, human-caused temperature increases often come about through reductions in canopy closure. The increased solar radiation that heats the stream also increases primary and secondary productivity, which increases food available to bull trout or other fish species. Thus, more food is available to offset the metabolic costs of increased water temperature. This correspondence between heat and food was demonstrated by Gamett (2002) in his study of bull trout in the Little Lost River of Idaho. As recounted by McCullough and Spalding (2002), Gamett reported the highest densities of bull trout in *"an area perturbed by a very intense fire in 1988, which also burned the riparian area"* (p. 11). Although McCullough and Spalding appear to use this example to illustrate how bull trout can only survive at higher temperatures with higher food levels, we submit that this better illustrates how temperature and food go hand-in-hand. Thus, the EPA should not feel compelled to select a colder criterion for bull trout because streams do not contain hatchery-like quantities of food.

In summary, we see no objective justification for selecting a 12°C 7DADM criterion over a 13°C 7DADM criterion. Selection of 12°C 7DADM appears arbitrary. Until the EPA conducts or sponsors quantitative risk-assessments of different temperature criteria, we

believe EPA would better serve the public by recommending ranges of thermal criteria that span the optimal range for bull trout and other species, and then let State's determine which specific criteria are appropriate for their circumstances. For the time being, since Idaho and particularly Washington have offered compelling, objective arguments in support of a 13°C 7DADM bull trout rearing criterion, we recommend EPA adopt this in its final Guidance.

The Criteria for Species/Life Stages besides Juvenile Rearing are Unnecessary

We agree with EPA that *“increased summertime temperatures due to human activities is the greatest water temperature concern for salmonids in the Pacific Northwest.”* We therefore believe that the criteria listed in Table 4 of Draft Guidance II are unnecessary. Each of these supplemental criteria appear to target a species/life stage concern that was identified in the Technical group's literature review, with little or no documented occurrence in the natural environment. The technical basis for these concerns is weak (derived from a few, mainly laboratory studies with low confidence in application to the field, e.g., see IDEQ dissenting opinion paper for discussion of steelhead smoltification criterion). The addition of these criteria greatly complicates implementation, monitoring, and enforcement aspects of the WQS without providing clear benefit to the region's salmonid populations.

For the bull trout spawning criterion, we believe EPA is correct in stating that summer rearing will cover spawning, incubation and other life stages through natural seasonal patterns of stream cooling (and warming). There is no reason to believe this won't be the case for all populations, regardless of their natural spawning timing. By ecological default, if 9°C is required to initiate spawning, then populations that spawn early in the season (i.e., prior to September 21st) do so in streams that have a seasonal thermal pattern that supports this.

To implement the salmon/trout spawning, egg incubation, and fry emergence criterion, impossibly intimate knowledge of species spawning times and locations is required. Would compliance be measured in the intra-gravel environment? Please refer to our February 2002 comments on Washington's draft water temperature criterion for further discussion of problems with setting criteria for this beneficial use. We recommend that EPA remove all three of these proposed species/life stage criteria unless or until they can be reasonably justified. Reasonable justification would mean that EPA could establish that human activities could produce a situation that poses a significant quantifiable threat to salmonid populations in the natural environment.

Guidance on Where Numeric Criteria Apply are Inappropriate

The basis for distinguishing “core” from “other” juvenile rearing criteria (Table 3) is subjective and vague. What EPA appears to suggest is that juvenile rearing successfully occurs across the range of temperatures between 12°C – 18°C, but that the fish exhibit a preference for the colder portion (below 16°C). By itself this concept is plausible, however states will have trouble during implementation of the criteria, owing to the language EPA offers to define where these criteria apply. For instance, we believe it is

inappropriate to declare that the 16°C standard will apply “*to the furthest downstream extent of current summer use for areas of degraded habitat where current summer distribution is shrunk relative to historical distribution.*” (emphasis added). Similarly, without conducting an analysis of thermal potential for streams in region 10, it is inappropriate for EPA to expect that 18°C will extend “*all the way to (a) river basin’s terminus.*”

As we stated in our comments on Draft Guidance I, EPA should encourage states to use a blend of the thermal potential concept and biological knowledge to estimate where species/life stage criteria apply. Physical characteristics of a basin will dictate where 13°C, 16°C, 18°C and 20°C are achievable. Knowledge of the distribution of different species/life stages can be used to fine-tune application of the criteria. Habitat features, fish densities or subjective evaluations of historical fish distributions are not acceptable measures for defining where these rearing criteria apply. Use of thermal potential modeling will also alleviate some of the need for TMDLs or Use Attainability Analyses because modeling can be used to set expectations for natural background thermal conditions (see below).

We recommend that EPA remove existing language in Table 3 and supporting text that includes subjective, value-laden descriptors of where and how the numeric criteria will be applied. Instead, EPA should indicate that the criteria will apply where they are attainable and where appropriate for the various species/life history beneficial uses.

Provisions for Unusual Weather and Naturally Warm Background Conditions are Overly Restrictive

The intent of these exemptions is clear: water bodies should not be judged to be impaired during years or seasons with extreme weather conditions, or when natural conditions make achievement of the criteria impossible. The two exemptions are also linked: they both describe circumstances where streams are naturally warmer than the criteria; some of the time in the first case, and most or all of the time in the second case. Given the limitations in our ability to understand and identify where species/life stages occur (i.e., where temperature criteria apply), EPA should not be overly restrictive in use of these provisions to exempt water bodies from listings as “impaired.”

In Draft Guidance II, the discussion of allowances for unusually warm conditions (p 19, section V.1) seems to suggest that EPA will “allow” weather to produce exceedences in only one of every ten years. Without a quantitative risk assessment, it is impossible to evaluate the population-level impact of this exceedence frequency. How much greater of an impact would be produced by exceedences in 2 of 10 years? Also, the notion of allowing weather to produce an acceptable frequency of exceedences is odd and unworkable. The recurrence interval for unusual weather can be described in terms of averages (e.g., 1 in 10 years), but it may as easily occur in two successive years of a 20 year period. The EPA discussion (third paragraph in this section) seems to suggest that somehow EPA has chosen numeric criteria that accounts for this recurrence interval. This is wrong. The criteria should be selected purely on the needs of the species/life

stages, and exemptions should be allowed whenever climatic conditions produce temperatures that exceed the criteria.

Attempts to use the natural background temperature provisions will face the same obstacle as the provision for unusually warm conditions. Without some way to objectively estimate where the numeric criteria are naturally attainable, there will be many instances outside (and inside) wilderness areas where measured temperatures will naturally exceed the criteria. This will invoke the costly and time consuming TMDL or UAA processes when some simple up-front modeling work would obviate the need for these processes. The EPA should encourage states to use the thermal potential concept to estimate where species/life stage criteria apply.

Other Comments

Westslope cutthroat, redband rainbow trout, and lahontan cutthroat omitted from the list of salmonids in Tables 3 & 4. Why?

EPA's proposed requirement to disallow any increase in temperature in waters that are colder than the recommended criteria (§V.2) is technically unjustified and practically untenable. EPA's dogged adherence to the false notion that "*these cold water segments in the upper part of a river basin likely plays a critical role in maintaining temperatures downstream*" is counterproductive and severely weakens our confidence in EPA's objectivity and technical competency. Numerous comments regarding this have been submitted in earlier reviews submitted by WFWA and OFIC. We recommend that EPA delete this section from the Draft Guidance II.

References

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- McCullough, D. and S. Spalding. 2002. Multiple lines of evidence for determining upper optimal temperature thresholds for bull trout.
- McMahon, F., A. Zale, J. Selong, and R. Barrows. 1999. Growth and survival temperature criteria for bull trout. Annual report 1999 (year two). National Council of Air and Stream Improvement. 12 pp.
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November 26, 2002

John Palmer
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RE: Potlatch Corporation Comments on EPA Second Draft of Regional Temperature Guidance

Dear Mr. Palmer:

Potlatch Corporation appreciates the opportunity to provide comments on EPA Region X Guidance for "Pacific Northwest State and Tribal Temperature Water Quality Standards," 2nd Public Review Draft dated October 10, 2002, also commonly referred to at the Regional Temperature Guidance (RTG 2nd draft in these comments).

Potlatch Corporation operates facilities in the Region X States of Oregon and Idaho. Potlatch commented extensively on the first draft of the RTG and wishes for those comments to be incorporated by reference in this proceeding as well. Potlatch Corporation works closely with the forestry associations in Region X and supports the comments of those organizations as well as the Northwest Pulp and Paper Association (NWPPA).

Potlatch appreciates EPA X's efforts to resolve some of the major issues raised by NWPPA and the regional forestry associations regarding the first draft of the RTG. These include: (a) legal and policy issues such as relationship to 304 of the Clean Water Act and role of state discretion in setting water quality standards; (b) the technical basis of the guidance acknowledging historically warm water temperatures of some rivers; and (c) simpler and clearer recommendations for state water quality standard setting including technical details applicable to point sources discharges.

We have concerns or comments for the record in each of these areas which can be summarized as follows:

I. Legal and Policy Issues

A. State Role In Setting Water Quality Standards

- EPA has described its role as specified in the CWA and ESA but by omission, still downplays the role of States under the CWA.

- Under the CWA, States have the primary responsibility and may take into account State scientific knowledge of unique environmental landscape that may affect water quality standard setting.

B. States Options for Taking Into Account Situations Where RTG Criteria are Unachievable Needs Clarification

- States should clearly have the option of considering this situation at the beginning of the standard setting process as well as in the form of adjustments to water quality standards that are later shown to be unachievable.
- Because historically warm rivers are fairly well documented and widespread in the Pacific Northwest (particularly mainstem rivers), EPA X should take care not to create a greater burden of proof on States wishing to take these into account.

II. Scientific Background Issues

A. Historically Warm Rivers

- The Columbia River and Lower Snake River have typically reached river water temperatures in excess of 22°C during every year of record over the past seventy years.
- Salmonid numbers have experienced cycles of both high and low returns during the past seventy years, regardless of the constancy of water temperatures higher than the recommended criteria.

B. Uncertainties Regarding the Literature of Temperature Needs of Salmonids Versus Actual Conditions in the Environment

- There may be more uncertainty with respect to the literature research regarding temperature requirements of salmonids than acknowledged by EPA X.
- EPA X introduces the theory that alluvial segments are no longer providing cold water refugia or that groundwater inflow (hyporheic flow) is impaired; however EPA X offers no empirical evidence of this phenomenon.
- There may be evidence that temperatures of the riverbeds of large mainstem rivers are quite cool.

III. Implementation Issues

A. State Water Quality Standards

- EPA X should improve the interpretation of “no measurable increase” when states adopt narrative criteria which supercede numeric criteria when natural background provisions are higher than the numeric criteria
- Specific recommendations regarding mixing zones are appropriate; however Potlatch recommends that EPA X clarify its statement regarding the technical support for the “instantaneous lethality” recommendation

IV. State Specific Comments

- Federal law sets guidelines for water quality standards that take into consideration public water supplies, recreation, agriculture, and industry, as well as fish and wildlife. The draft temperature guidance only deals with a small group of aquatic species. There needs to be recognition that salmonids are not the only fish population in Idaho streams, and those other species also require temperature considerations.
- Idaho has already adopted temperature standards for protection of cold water/species, as authorized in the Clean Water Act. The RTG 2nd draft is not consistent with federal and state law. The provisions to protect existing cold water, colder than the numeric criteria, appear to go beyond the Clean Water Act requirements, and therefore beyond what the State of Idaho have authority to regulate. Idaho's specific language on implementing temperature criteria is not consistent with the proposed EPA guidance. Idaho's rules also have provisions for variances from water quality standards to take into account naturally occurring conditions. The RTG is not clear on how Idaho would incorporate existing state standards with the proposed temperature guidance, including state mixing zone policy.
- As stated above, the standards ignore Idaho's individual and unique conditions. One result of establishing standards with unreachable numeric criteria is that many Idaho streams and stream segments will be added to the state 303(d) list, resulting in new, expensive and unnecessary TMDLs.
- Idaho Department of Environmental Quality states "Idaho's large low-elevation rivers will not be able to meet the 20°C criterion for migration. This sets up the need for expensive and likely contentious determination of natural temperatures to recognize the simple fact that fish use sub-optimal waters at times." Idaho has already conducted research in water quality to protect salmonids, and believe their numbers are more realistic than EPA X's.
- The guidance is not consistent with the best available scientific and technological information. The facts show that the proposed EPA X temperature criteria are not achievable for most streams in the interior Columbia Basin. Further, there is documented evidence that fish do migrate and thrive at temperatures well above the EPA X proposed criteria, and that species of concern have existed in Idaho waters for decades. Temperature is not the only criteria impacting salmonid populations and there is no way to know if efforts to reduce temperatures will provide measurable benefits.
- EPA X did not include an analysis of the costs to states and the private sector of implementation of these standards. The 2nd draft does discuss the scenario when the criteria cannot be met without causing widespread economic and social impact. However, a solution proposed by EPA X, the Use Attainability Analysis, may not be workable in most waters found in Idaho. A better solution would be to set guidance temperatures at more realistic levels.

We feel strongly that any document must give Idaho and other states flexibility to deal with local conditions, and must give states the opportunity to utilize the best available scientific

information. The EPA document is much more than guidance, and seems to attempt to predetermine state decisions. Any guidance document must also be consistent with the federal clean water act, and take into consideration financial and economic realities for both government and private industry.

Thank you for the opportunity to comment on this guidance document.

Sincerely,

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RY TIMBER, INC.

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November 25, 2002

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RE: Draft EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards

Dear Mr. Palmer:

RY Timber has been part of the effort in Wallowa County, Oregon to help recover the endangered salmonids since 1992. We were an active member of the group that developed the Wallowa County/Nez Perce Tribe Salmon Recovery Plan.

We have reviewed the October 10, 2002 Public Review Draft of the above standards and have the some concerns, comments, and suggestions.

On pages 11 - 13 the use of the terminology "human - caused elevated temperatures" is used 14 times. The use of this terminology would suggest that the salmonids only have a problem with human caused elevated temperatures and that those temperatures that are naturally high present no problem to the salmonids. I assume that "human caused elevated temperatures" was used to present a situation that we might have some control over.

Using a seven - day running average of daily maximum temperatures (Tables 3 and 4) without establishing a time - dependent maximum temperature for short exposures is using incomplete information for establishing recommended criteria according to the National Academies of Sciences and Engineering report to EPA in 1972 and Issue Paper 3 - Spatial and Temporal Patterns of Stream Temperature. The use of Eco-System and Diagnosis and Treatment methodology could establish historical critical reaches for different species and life stages and then that could be used to develop more meaningful water temperature targets.

The "natural background" provisions allow for deviation above the listed standards with the use of a narrative when the waters exceed the numeric criteria and human impacts are negligible. We support allowing such deviations since we have several instances in Wallowa County where we could use such narrative explanations. Examples: we have streams with measured temperatures at 57F in the wilderness and are considered by

ODFW Fish Biologists to contain healthily, self-sustaining Bull Trout populations. Similarly, the Imnaha River in Wallowa County has measured temperatures that exceed 68F in its lower reaches near the Snake River and yet the Chinook Salmon recovery on the Imnaha is deemed a success story by the Nez Perce Tribe.

The statement that to follow a Use Attainable Analysis (UAA) approach that supports a marginal or limited use that the overall watershed context must be completed showing where within the watershed EPA's fully protective criteria can be met assumes that EPA's criteria is correct. Site-specific evaluation of the watershed to determine the conditions available and needed for salmonids, rather than hard temperature standards is the correct method to use in salmonid recovery and Water Quality Standards.

Sincerely,

Bruce H. Dunn
Forester



Washington Forest Protection Association

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November 26, 2002

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**Subject: Comments in response to the 2nd Public Review Draft EPA Region 10
Guidance for State and Tribal Temperature Water Quality Standards
(Public Review Draft, October 2002)**

Dear Mr. Palmer:

The Washington Forest Protection Association (WFPA) appreciates the opportunity to provide comments on the Environmental Protection Agency (EPA) Region 10 2nd Review draft guidance for developing water quality standards for temperature that protect native salmonids (Draft Guidance II). WFPA members are large and small private landowners who grow and harvest trees on 4.5 million acres in Washington State. We request that the comments we submitted on February 22, 2002 in response to the first draft of the EPA Region 10 Guidance for State and Tribal Temperature Water Quality Standards (October 2001) be included by reference in this round of public comment.

Comments – Regulatory Background

WFPA appreciates the improvements in Draft Guidance II. In particular, we support most findings in the section titled “Regulatory Background”. EPA has better captured the

appropriate role of policy guidance in relation to state responsibility for promulgating water quality standards. EPA correctly notes that the proposed temperature guidance grants no rights, imposes no obligations, and genuinely leaves state decision-makers free to exercise discretion in promulgating temperature criteria that are protective of designated uses.

WFPA also agrees in part with EPA in how that agency has captured the relationship between the states, tribes, and federal government in achieving the objectives of the Clean Water Act (CWA). As acknowledged by EPA in Draft Guidance II, the CWA assigns the primary role of establishing state water quality standards to the states. EPA has the role of reviewing proposed state water quality standards and approving or rejecting them. When EPA is reviewing the states' water quality standards, the standard for determining adequacy must rest on whether the states' decisions are scientifically defensible and protective of beneficial uses. We recommend that EPA's guidance reflect the fact that, if EPA determines that a state's proposed standards are not appropriate, the next step is for EPA to notify the state and suggest modifications that it considers necessary to meet CWA requirements. The state then may accept those suggestions or ask for further clarification of and data supporting EPA's concerns. Section 303(c)(4)(B) provides EPA with "discretionary authority ... to force a state to accept 'a revised or new standard ...[if] necessary to meet the requirements of the [CWA],'" *National Wildlife Federation v. Browner*, 127 F.3d 1126 (D.C. Cir. 1997). However, it also provides opportunities for the state and EPA to exchange information and seek agreement before EPA takes the extraordinary step of adopting a water quality standard on behalf of the state.

WFPA also appreciates EPA's clearer explanation of why the Draft Guidance II does not recommend that states rely on the national 304(a) criteria when developing temperature standards for cold-water salmonids in the Pacific Northwest. It is further evidence that EPA acknowledges that the states have the discretion and latitude to determine how best to translate available science, including science provided by EPA in the guidance, into a regulatory regime that takes into account additional factors relative to its own unique geographic setting, current water quality conditions, and desires of its citizens regarding beneficial uses.¹ As EPA notes in Draft Guidance II, EPA's regulations encourage states to adopt water quality standards that reflect site-specific conditions and to consider other scientifically defensible methods to derive criteria to protect the designated uses.

The importance of allowing a state to take into account its unique set of circumstances is critical for success in meeting the goals of the CWA. Each state, particularly when backed by science, must use its discretion to promulgate protective criteria in a manner able to be implemented on the ground. Overly complicated and/or protective criteria will result in inefficiencies for the state when implementing other sections of the CWA. The costs and complexities inherent in developing TMDLs or UAAs necessitates guiding the

¹ Commentators have noted that water quality standards-based regulation "... rests squarely on human use ... (d)ecisions about water use should be made by people who use it ..." See generally, Houck, Oliver A. 1997. *TMDLs: The resurrection of water quality standards-based regulation under the Clean Water Act*. 27 Env't. L. Rep 10329. Environmental Law Institute®.

states to set standards that are protective, yet practicable and conducive to site-specific conditions.

WFPA also agrees with the description of the legal relationship between EPA's approval of state water quality standards and the ESA, in particular the requirements of ESA section 7(a)(2). However, WFPA recommends that this section note that the ESA requires both the action agency and the consulting agencies to "use the best scientific and commercial data available" in conducting ESA consultations. 16 U.S.C. § 1536(a)(2). As contrasted with decisions to list species as threatened or endangered under section 4 of the ESA, this does not imply that EPA or the Services must rely *solely* on the best available commercial and scientific data in reaching the ultimate decision, e. g. whether EPA should approve a state's proposed water quality standards. Rather, the best available data should be considered in the consultation process but EPA's final decision can and often should consider other information in carrying out its duties under the CWA.²

Finally, under rules jointly adopted by NMFS and USFWS, ESA consultation is required only for federal actions which "may affect" ESA-listed species. 50 CFR 402.14(a). Formal consultation is not required if, on the basis of informal consultation, the action agency (in this instance, EPA) determines, with concurrence of the Service(s), that its proposed action is not likely to adversely affect any listed species or its habitat. 50 CFR 402.14(a). For this purpose "effects of the action" refers to effects "that will be added to the environmental baseline," which is defined to include "the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process." 50 CFR 402.02.³

Thus consultation is needed for EPA approval of a proposed state or Tribal WQS only where such approval is expected to cause changes from the baseline, and formal consultation is required only where those changes are expected to cause temperatures to be significantly worse than the baseline, as so defined. In many cases, EPA approval of proposed state water quality standards should not be expected to change baseline conditions; rather, its purpose is to establish temperature goals that may be designed to maintain rather than change baseline conditions. Where proposed water quality standards

² ESA consultation requirements under ESA Section 7(a)(2) are different than ESA section 4 provisions that outline the process for listing species. 16 U.S.C. § 1533(b)(1)(A). The agency action in question, here EPA's decision with respect to a state's proposed water quality standards, is made under the CWA rather than the ESA and must be based on authority granted to it under the CWA. *American Forest & Paper Association v. EPA*, 137 F. 3d 291 (5th Cir. 1998). We also suggest that EPA approval of proposed water quality standards will seldom, if ever, be the proximate causes of an unlawful "take". We believe it will be difficult for the Services to consider EPA's approval of water quality standards to be the proximate cause of actual death or injury to identifiable members of a listed species in circumstances that would constitute an unlawful "take." Unless EPA's action would be the proximate cause of an unlawful take, it is improper for the Services to include an incidental take statement in their biological opinion. *Arizona Cattlegrowers' Ass'n. v. U.S. Fish and Wildlife Service*, 273 F. 3d 1229 (9th Cir., 2001)

³ For examples of actions already addressing the effects of thermal increases and the effect on salmonids, see Appendix A and WFPA's previous comments to EPA dated February 22, 2002.

are intended to contribute to improvements in water temperature, they should not be considered likely to have adverse effects on ESA-listed salmonids so even if they “may effect” those species they should be considered “not likely to adversely affect” them. In short, temperature criteria will seldom be expected to “add to” adverse effects that have already occurred or may occur anyway from human activities included in the baseline.

Comments – Water Temperature and Salmonids

WFPA appreciates the more objective discussion concerning human activities that can contribute to excess warming of rivers and streams. The description of human activities that can warm waters allows the states to demonstrate to EPA that their proposed water quality standards do appropriately address the protection of designated uses, in light of site-specific conditions and relying on scientifically defensible methods. This may include seasonal shifting of climatic patterns and their interaction with topographic features that can create temporal and spatial variability in stream temperatures unique to a particular state or eco-region within a state. This natural variability can make the development of precise temperature standards a challenging task. Therefore EPA should review states’ proposed water quality standards in context of an entire submittal package.⁴ WFPA particularly appreciates the discussion under Section VI.1. – Adoption of Site-Specific Numeric Criteria that Supports the Use (p. 29, Draft Guidance II), as we believe the guidance provides that states with the flexibility to demonstrate when alternative site-specific criteria are appropriate due to limitations on human development activities or other site-specific factors.

⁴ For example, see USEPA. 1987d. *Nonpoint Source Controls and Water Quality Standards*. (Memorandum from Chief, Nonpoint Source Branch to Regional Water Quality Branch Chiefs; August 19.) Washington, D.C. In the memorandum and a current resource in the EPA Water Quality Standards Handbook: Second Edition, EPA states: *“It is intended that proper installation of state approved BMPs will achieve water quality standards. Therefore, water quality standards are to be used to measure the effectiveness of BMPs. In the review and revision of water quality standards as provided in the CWA, the State should ensure that water quality standards are achievable and that water quality criteria reflect what is needed to assure protection of beneficial uses. As provided for in EPA’s National Nonpoint Source Policy Statement, there should be ‘flexibility in water quality standards to address the impact of time and space components of NPS as well as naturally occurring events.’ This involves consideration of the variability of natural conditions, magnitude and frequency of impact, and level of acceptable risk.”* (Emphasis added) Clearly, EPA’s policy statement recognizes the challenges created by relying solely on a water quality based approach to cleaning up waters impacted by diffuse nonpoint sources of pollution as contrasted with promoting elimination of sources of pollution as supported in CWA §§§208, 303(e) and 319. The state of Washington, for instance, requires a full suite of regulatory BMPs that are pollution-prevention measures to address forestry activities on non-federal forestland (RCW 76.09). The forest practices rules (WAC 222) prevent the pollution from occurring, e.g., solar radiation from reaching the stream surface or management induced sediment from entering the stream. The Forest Practices program under the Forests & Fish Report will include, but is not limited to the following required controls and maintenance procedures: a water typing system designating fish habitat to drive riparian protection measures, riparian buffers for fish habitat waters based on regionally appropriate site potential tree height and “desired future conditions”, required buffers and equipment limitations for non-fish habitat streams, an identification process to address steep and potentially unstable slopes, and mandatory plans for forest road systems to address sediment, water runoff, and fish passage. (See Appendix B for updates on implementation of forest practices. See WFPA comments to EPA dated February 22, 2002 for full description of forest practices under the Forests & Fish Report)

For instance, the development of numeric temperature criteria often relies on laboratory studies. However, thermal tolerance criteria developed in laboratory studies may be of limited value in helping understand the effects of forest management on fish communities in the Pacific Northwest. As reported in Beschta et al, (1987):

(S)stream temperatures through the [Pacific Northwest] region seldom exceed, for extended periods, the tolerance limits of the resident salmonid species. The fish themselves also appear to be behaviorally 'plastic' and can act to reduce either or both the temperatures they are exposed to and the duration of the exposure. For instance, salmonids appear to seek out cool water regions in stream where temperatures approach and exceed tolerance limits (Gibson, 1966, Kaya et al, 1977).⁵

EPA is wise to allow states flexibility in establishing standards that are based on site-specific conditions. There seems to be no single numeric value that can scientifically be considered the absolute best value.⁶ Any proposed standards, including those different than what EPA is recommending in the Draft Guidance II, need to be assessed in light of current understanding of the biological and ecological functions of the ecosystem and the ways water temperatures vary in space and time throughout stream systems. Water temperature in streams is a function of the energy balance between heat input and heat loss. There are at least seven primary processes that control the transfer of energy (Wunderlich 1972; Jobson and Keefer 1979; Brown 1983; Beschta and Weathered 1984; Theurer et al. 1984; Adams and Sullivan 1990; Sinikrot and Stefan 1993; Adams 1999; ODEQ 1999):

1. Solar (short-wave) radiation.
2. Long-wave radiation exchange between the stream and the sky.
3. Evaporative exchange between the stream and the air.
4. Convective exchange between the stream and air.
5. Radiation exchange between the stream and adjacent vegetation and surroundings.

⁵ Beschta, R.L., R.E. Bilby, G.W. Brown, L.B. Holtby and T.D. Hofstra. 1987. Stream temperatures and aquatic habitat: fisheries and forestry interactions. P. 191-232. In: E.O. Salo and T.W. Cundy (eds.). Proceedings Symposium Streamside Management: Forestry and Fishery Interactions. February 12-14, 1986. University of Washington, Seattle, WA.

⁶ WFPA suggests EPA should be mindful that it may be better to provide states' with a range of temperature criteria that a state could choose based on its own deliberative process of setting standards that are protective of designated uses while taking into account other uses of water. Risk assessment, based on criteria ranges, would provide the state with information, in addition to their own science and site-specific conditions, for making decisions concerning numeric criteria to protect designated uses. For instance, we believe the state of Washington has made a compelling, science-based rationale for designating bull trout use and temperature criteria that is different than what is suggested in Draft Guidance II. We assume the final Guidance will provide the flexibility states are entitled to in using their science and site specific conditions, including consideration of ESA-based plans and other water quality driven regulations currently being implemented to protect against management induced thermal warming, to designate uses and establishing protective criteria.

6. Conduction transfer between stream and the streambed.
7. Groundwater exchange with the stream.

The importance of each process depends on local, site- specific conditions. The primary environmental factors affecting these processes and water temperature at any location are (Edinger et al. 1968; Adams and Sullivan 1990; MBTSG 1998):

- Riparian canopy
- Topography
- Azimuth
- Local air temperature
- Groundwater inflow
- Stream depth
- Stream width
- Streamflow

EPA guidance supports states moving beyond technical literature reviews that define suitable temperature ranges for various life stages of salmonids under static laboratory conditions. The draft guidance appropriately recognizes that states will need to consider alternative scientifically defensible methods and site-specific conditions to take into account the diversity and variability found in natural habitats. This will likely include the use of both numeric and narrative criteria to protect designated uses and address the natural variability of the aquatic ecosystem. It will also likely include the allowance of some warming above the water quality

Comments - The Role of Temperature WQS in Protecting and Recovering ESA-listed Salmonids and Examples of Actions to Restore Suitable Water Temperatures

WFPA appreciates that the Draft Guidance II recognizes activities are already being implemented to reverse adverse effects of past human activities that contribute to excess warming of river temperatures. WFPA strongly suggests that EPA change the language on pages 32 and 33 to include more programs that are a part of states' continuing planning processes, including 303(d) implementation and 319 Reports.⁷

⁷ In regards to Section 319, Congress intended that states would develop non-point programs based on central, policy-setting direction from the States in implementing the non-point source management programs and reflect a key element in the development of water quality standards e.g., a use is deemed attainable if it can be achieved by imposition of all applicable national effluent limits on point sources and adoption on a reasonable control program for non-point sources. 40 C.F.R. § 131.10(d), (h)(2). The non-point source management programs must, by law, meet the goals of the CWA and achieve reduction in nonpoint source pollutant loadings by the implementation of best management practices by sources and to do so at the earliest practicable date. The State of Washington for instance, submitted its program in 2000 and in reviewing the management plans, EPA recognized the Washington State's 319 program as having

WFPA also suggests that the last paragraph on page 33 be expanded to be more specific about how states should describe on-the-ground activities that are reversing the legacy effects of human activities that can contribute to excess warming of river temperatures. The guidance should encourage states to do more than simply “highlight” the activities in order “provide a model for others to take similar action”. These on-the-ground actions, many directly approved by the Services and EPA and relevant state agencies, have gone through public scrutiny and environmental review under relevant laws such as ESA, CWA, NEPA, and the Administrative Procedures Act. Some of these plans have been challenged in court, and upheld.

States should be encouraged, through the guidelines, to propose standards through submittal packages that include not only the proposed numeric/narrative standards, but also describe the policies and provisions regarding water quality standards implementation. This does not mean that the state must submit an implementation plan for EPA approval. Rather, the water quality submittal package should include background information on the state’s regulatory and non-regulatory mechanisms that will help EPA understand how various water quality control programs may have influenced the state’s development of proposed water quality standards. Because each state will strive to achieve its water quality standards through its own unique set of regulatory requirements and non-regulatory programs, its water quality standards should be compatible with the management framework that will be used to achieve them. Of course designated uses, particularly salmonid species, should be protected, but the tools available to protect them depend on the unique history and legal framework of the particular state.⁸

EPA’s review for adequacy and the Services’ consultation processes should be based on the following evaluation measures:

- Numeric/narrative criteria that meet the goals of the CWA, support designated uses, and include anti-degradation policies;
- A baseline assessment of water quality conditions [305(b) Report, TMDLs, water quality assessments to determine attainment of designated uses];

“Enhanced Benefits Status”. This means the state program meets nine key elements that EPA identifies for upgraded state non-point programs. EPA recognizes only seven states in the country as having met these criteria. EPA should acknowledge the state of Washington’s 319 program – or any other states’ approved 319 programs, within the context of programs and planning that meet water quality standards and improving water temperature.

⁸ Please see Appendix A for an example of the integrated program currently being implemented in Washington State to address native salmonid protection and water quality/quantity protection. The examples supplement information we provided to EPA in our February 22, 2002 comments in response to the first draft Temperature Guidance and provide specific examples of how programs are being implemented over the last year. These programs, in addition to programs we discussed in more detail in our earlier comments, address human activities that can deplete salmon and adversely affect water quality, including thermal warming. Many of these programs will address aquatic habitat protection including specific measures to restore the chemical, biological, physical health of water and include the active involvement of the Services and EPA.

- A baseline analysis of water quality and ESA-based programs that will assist in defining the physical, biological, and chemical characteristics of waters. Examples of policies and provisions concerning water quality standard implementation could include:
- ESA approved planning under Section 4(d), 7, or 10(a) that addresses ESA level protection for designated uses;
- Water quality management plans – such as watershed planning efforts;
- Source Controls including CWA Section 319 program and CZARA section 6217 programs to control NPS pollution (see footnote 6 for more thorough discussion).

Many of those factors will vary from state to state and may vary for different eco-regions within a state. The final EPA guidance should recognize and embrace these diversities. EPA's goal should be not to develop a "one size fits all" solution for all states in the region, but to provide guidance that helps each state make best use of its own institutions to best achieve CWA goals in its own unique situation.

Sincerely,

A handwritten signature in black ink, appearing to read "Ann Goos", with a stylized flourish at the end.

Ann Goos, Director of Environmental Affairs

cc. Megan White, Ecology
Tom Eaton, EPA

Appendix A – Specific Examples of Human Activities in Washington State to Improve Practices that can Harm Salmon, Water Quality, and Water Quantity.

Pacific Coastal Salmon Recovery Fund

The Pacific Coastal Salmon Recovery Fund (Fund) was established in FY2000 to provide grants to states and tribes to assist state, local and tribal salmon recovery efforts. The Fund was requested by the governors of Washington, Oregon, California and Alaska to respond to Endangered Species Act (ESA) listings of west coast salmon and steelhead populations, as well as to implement habitat restoration provisions of the 1999 Pacific Salmon Treaty Agreement.

Fund money is provided to the Salmon Recovery Funding Board, a Washington state body created by the legislature in 1999 to invest state and federal funds for salmon protection and restoration projects and related programs. The fund is used for salmon habitat restoration; salmon research and monitoring, including planning and assessment; salmon enhancement; and outreach and education.

The Fund supplements existing state, tribal and federal programs, and is subject to a 25% state or local match. Together, these programs foster federal-state-local partnerships in salmon recovery and promote efficiencies and effectiveness in recovery efforts. The fund is administered through NOAA, and Memoranda of Understanding have been developed with state and tribal authorities that establish processes for state/tribal distribution of funds, reporting requirements, monitoring and evaluation, and other performance measures to ensure accountability and public access to the information developed with these funds.

Purpose: Salmon Recovery Through Science, Stakeholder and Local Involvement for Immediate Improvement in Aquatic Habitat and Water Quality

An effort to develop multi-species recovery plans at the regional and watershed levels is underway in Washington State. To accomplish this monumental task, regional salmon recovery boards and watershed planning groups, called Lead Entities, bring together scientists, stakeholders, grassroots organizations and governments at the federal, state, local and tribal levels together as they develop salmon recovery plans and projects for their region based on local conditions and consensus building. State and federal agencies participate in planning and contribute to implementation through a variety of programs.

Structure: Science based Salmon Recovery through Local Stakeholders

The Salmon Recovery Funding Board (Board) conducts its work in consultation with the Governor and consistent with the state salmon strategy, “Extinction is Not an Option.” It funds the best salmon habitat projects and activities based on local priorities and the best available science.

The Board's work fosters inclusion and coordination of scientific support at all levels integral to salmon recovery. It is performed with a comprehensive understanding of harvest and hatchery practices, hydropower operations, water quality issues, instream flows, and Northwest Power Planning Council programs. The Board requires that each funded project and program be measured for success. In concert with other salmon recovery efforts, the Board supports an overall monitoring strategy to assess the long-term success of all recovery efforts. Public participation and outreach are integrated into Board actions. Board funding leverages local matching funds to cover project costs.

All projects funded by the Board must come through one of the Lead Entities, 26 watershed-based groups that include citizens, counties, tribes, non-profits, and others. They prioritize projects based on limiting factors analysis and community priorities. A panel of scientists reviews the projects for technical merit.

Five regional salmon recovery boards are also operating across the state and complement the watershed-based groups. These are based on the salmon recovery regions identified by Governor Locke in consultation with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS). Each of these regional boards has self-initiated, with the exception of the Lower Columbia, which was created by state statute.

The regional approach supports grassroots involvement and local capacity by providing a central communications point for the state and federal programs that impact the region. Regional coordination provides a common venue to help provide focus for elected officials and citizens on natural resource policy issues, including the following parties:

- Local governments (counties, cities, port districts, public utility districts, conservation districts and irrigation districts)
- Tribal governments
- State and federal governments
- Stakeholders (concerned citizens, business interests, private property owners, environmental community, hydro-project operators, agriculture, volunteer groups, watershed planning groups and regional fish enhancement groups)

Funding and Results: *Science-Based Projects Providing Immediate Results*

The Board provides grants based on regional planning to local governments, tribes, nonprofit organizations and state agencies for salmon habitat restoration, acquisition and assessments. In the 1999-01 biennium, the Board awarded \$99.4M (\$36.2M state and \$63.2M federal) in grants and programmatic activities for salmon recovery. Of that \$99.4M, \$96.4M went to funding 517 projects.

The 2001-03 biennial budget assumes \$43.6M (\$30.0M for FY 2002 year and \$14.0M for FY 2003, less administrative overhead) from the Pacific Salmon Coastal Recovery program, administered by NMFS. Washington State is providing a match of \$26.3M.

The following provide examples of salmon recovery projects administered by local organizations and funded by the Salmon Recovery Funding Board.

Gorst Creek Restoration

Kitsap County

Funding: \$0.53465M (SRFB \$0.36815M, Local match \$0.1665)

The Gorst Creek restoration project takes almost 720 feet of stream from a concrete lined channel and restores it to a natural condition. About 1000 feet of stream will be rebuilt into a natural configuration with bottom gravels suitable for spawning chum, coho, steelhead, and chinook. Adjacent wetlands will be restored, and native vegetation planted along the stream.

Rock Creek/Ravensdale-Retreat Acquisition

King County

Funding: \$0.583M (SRFB \$0.2M, Local match \$0.383M)

This project will help protect over 200 acres of land along Rock Creek, called the Ravensdale-Retreat reach, recognized as one of the most valuable tributaries to the lower Cedar River. The acquisition includes 1.6 miles of Rock Creek, forested and shrub wetlands, ponds, and forestlands. A partnership of King County, Friends of Rock Creek Valley, and the National Fish and Wildlife Federation have combined funds to purchase and protect this area that is an important spawning habitat for chinook, sockeye, coho, and steelhead. An additional benefit will be realized by wildlife such as elk, bear, and cougar.

Salazar Culvert Replacement

Thurston County

Funding: \$0.98769M (SRFB \$0.74869M, Local match \$0.239)

This project will replace a set of culverts in Woodland Creek, an important urban tributary to Henderson Inlet in Puget Sound. The culverts are partial fish passage barriers that were further compromised during the Nisqually earthquake, posing a risk for continuing problems in the future. Chum, coho, cutthroat, steelhead, and chinook will benefit from the improved passage, and the entire system will see enhanced migration of streambed materials that will provide better distribution of nutrients and spawning gravels. Partners include landowners and the Lacey Stream Team.

Puyallup River Setback Levee

Pierce County

Funding: \$3.3256M (SRFB \$0.99M, Local match \$2.3356M)

Pierce County, the Puyallup Indian Tribe, and the Army Corps of Engineers are designing and constructing this levee project that addresses two key factors limiting salmon production in the Puyallup River: spawning and rearing habitat. These funds

provide a 35% match for the Corps funding and will result in the width of the river increasing from its present 250 feet to 1150 feet. Increasing the channel width will provide off-channel rearing and refuge habitat, reduce channel grade, slow water velocities, all of which support productivity of the upper Puyallup River. Combined with a new fish ladder and increased minimum flows at Electron Dam, this project will improve conditions for coho, chinook, and bull trout.

DuPuis Chelatchie Creek Project

Clark County

Funding: \$0.037177M (SRFB \$0.029337M, Local match \$0.00794M)

The Cedar Creek watershed in Clark County provides the majority of spawning and rearing habitat left for all species of anadromous fish in the North Fork Lewis River system. A local volunteer organization called Fish First will restore and improve Chelatchie Creek, tributary to Cedar Creek, thereby providing better spawning habitat for chinook, coho, and steelhead. Cutthroat trout will also benefit from the project.

Beaver Creek Fish Passage Barrier

Okanogan County

Funding: \$0.325024M (SRFB \$0.203024M, Local \$0.122M)

Seventy-eight fish passage barriers have been catalogued in the Beaver Creek system. This project begins the task of restoring the creek by removing four dams and replacing them with instream structures that will allow irrigators to continue to draw water for their diversion ditches, but will also permit salmon to navigate upstream. A fifth structure will be replaced with a well. Instream work to address spawning and rearing is also part of this project that targets endangered chinook.

Patit Creek Barrier Removal

Columbia County

Funding: \$0.00185M (SRFB \$0.008955M, Local match \$0.009545M)

Patit Creek, a tributary of the Touchet River, is home to threatened steelhead. An old dam approximately one mile above the mouth of the river impedes passage both up and down the creek, except during high stream flows. The dam will be removed and replaced with log and rock weirs that create a step pool to help steelhead move along the length of the creek.

The Hatchery Reform Project

Introduction: A New Role for Hatcheries

Hatchery facilities in Puget Sound and Coastal Washington were built to produce fish for harvest, compensating for declines in wild salmon populations and loss of habitat. Today they are important to the North Pacific sports and commercial fishing economy, to meeting tribal treaty harvest obligations, and for salmon conservation.

Although hatcheries have generally been successful at fulfilling these purposes, the state and tribal co-managers of Washington State's salmonid fisheries have recognized that hatcheries have also been identified as one of the factors responsible for the depletion of wild salmon stocks.

- Some facilities have produced stresses for wild fish, kept smolts from getting downstream, kept spawning adults from getting upstream and lowered water quality.
- Physical and genetic interactions between wild and hatchery fish may have weakened natural stocks.
- Hatchery management decisions to correct these negative effects have more often been piecemeal than system-wide

Purpose: Salmon Conservation and Sustainable Fisheries

In 1998, Congressional representatives appointed a science panel to review the role of hatcheries in Washington State. This panel recommended a process for hatchery reform based on independent scientific review. The U.S. Congress agreed and funded the Puget Sound and Coastal Washington Hatchery Reform Project beginning in fiscal year 2000.

This project is a systematic, science-driven redesign of hatcheries to:

- Help recover and conserve naturally spawning populations.
- Support sustainable fisheries.

After decades of piecemeal reform efforts the funding, independent science and strong leadership needed to reform hatchery programs regionally and system-wide is in place.

Structure: Comprehensive Reform Driven by Independent Science

In 1999, three Puget Sound and coastal salmonid stocks were listed as threatened under the federal Endangered Species Act (ESA.) As a result, state and tribal co-managers must demonstrate that their hatcheries minimize risks to listed species. Through the Hatchery Reform Project, the co-managers seek to go beyond ESA directives by reforming hatchery programs to provide benefits to the process of recovering wild salmon and

providing sustainable fisheries. For the first time hatchery management decisions will be based on a blueprint of system-wide, scientific recommendations, providing an important model that can be replicated in watersheds beyond Puget Sound and the coast.

Independent Science

The Hatchery Reform Project recruited a diverse, accomplished and independent scientific panel - the Hatchery Scientific Review Group (HSRG) - to assemble, organize and apply the best available scientific information to provide guidance to policy makers who are implementing hatchery reform. HSRG holds monthly, three-day meetings to perform the review of more than 100 hatchery programs in 10 regions of Puget Sound and coast of Washington.

Empowered Policy-makers

To allow for a scientific review while providing a coordinated policy response, the co-managers created a top-tier policy committee - the Hatchery Reform Coordinating Committee - to work with HSRG and ensure implementation. Committee members include representatives from the Northwest Indian Fisheries Commission (NWIFC), the Nisqually Tribe, the Washington Department of Fish and Wildlife (WDFW), the U.S. Fish and Wildlife Service (USFWS), the National Marine Fisheries Service (NMFS), former members of the Congressional Hatchery Science Advisory Team and Long Live the Kings (LLTK).

Facilitation Team

The third party facilitator specified by Congress is Long Live the Kings (LLTK), a private, non-profit organization whose mission is to restore wild salmon to the waters of the Pacific Northwest. LLTK's role includes providing facilitation and project management to the HSRG and the Coordinating Committee. LLTK also helps the co-managers communicate hatchery reform progress to Congress, state legislators, stakeholder groups and the public.

Funding Results: Demonstrating Progress

\$12M in congressional funding over the last three years has supported the hatchery reform process. Several groundbreaking results have already been achieved by this project.

Region-by-Region Review: The Focus of the Hatchery Reform Project

The Scientific Group and Coordinating Committee agreed that it is important to evaluate hatchery programs in the context of the watersheds in which they operate and the goals set for them by the managers.

The scientists divided Puget Sound and the coast into ten regions so recommendations could be based on:

- Regional management goals for conservation, harvest and other purposes
- Stock status (biological significance and population viability)
- Current and future habitat status
- Particulars of each hatchery program

Reform recommendations for three regions were released in a report in February 2002. Three more regions will be complete by the end of 2002 and the remaining recommendations are expected by the end of 2003.

In addition to 218 program-specific recommendations, the February 2002 report also included eleven area-wide recommendations—reform measures that apply to the entire Puget Sound and coastal Washington area. Specific program-by-program recommendations were provided in the context of minimizing genetic risks, increasing fish health, applying management practices, and providing facilities appropriate for conservation, harvest or education goals.

Hatchery Reform Project Tools

In the first year of the project, HSRG established several tools to aid in their deliberations and support the goals of the project:

- A scientific framework to inform HSRG decision-making and recommendations
- A benefit/risk assessment tool to evaluate specific actions and choices in hatchery management
- Hatchery operational guidelines to implement reforms at each facility
- Monitoring and evaluation criteria to help determine the success of hatchery programs and gather data for research
- A competitive research grant program to fill gaps in scientific knowledge: over \$1.7M awarded to fund research projects such as reducing harvest on wild fish, avoiding adverse genetic effects of hatchery fish on wild stocks, avoiding adverse ecological interactions, improving hatchery practices and monitoring and measuring success.

Other Outcomes

In addition to the region-by-region review and the development of project tools, HRP has contributed to two other significant developments.

Science Teams

Science teams at WDFW and NWIFC have been established with the support of Congressional funding. These teams have undertaken a variety of activities to support the hatchery reform process including:

- Risk analysis on hatchery programs to meet ESA requirements
- Research on hatchery effects and practices that complements the Scientific Group's research grant program
- Helping implement reforms
- Gathering data and otherwise providing technical support to HSRG, the Coordinating Committee and the regional staff participating in the review process
- Completing the Hatchery Genetic and Management Plans required by NMFS for each hatchery that affects a listed species

Implementation: Hatchery System and Program Improvements

The state and tribes are implementing HSRG recommendations at several scales. Each year, a portion of the project funding has been allocated directly to the state and tribes for implementation. Examples include:

- ***Protection of Threatened Species:*** WDFW has integrated all of the recommendations that are applicable to the chinook salmon ESA listing into the Hatchery and Genetic Management Plans for the National Marine Fisheries Service.
- ***Programmatic Implementation:*** Throughout WDFW new policy and management tiers are under consideration, new responsibilities for staff will be outlined, and hatchery program monitoring and evaluation is under review.
- ***Program-by-Program Implementation:*** Individual program management recommendations from HSRG's first three regions have been implemented to increase the success of conservation and harvest programs:

- *Species Preservation:* The Elwha Fish Restoration Team is evaluating options for preserving Elwha Chinook during the removal of dams and is incorporating HSRG recommendations for improved stock management.
- *Hatchery Closure:* The McAllister Creek Hatchery on the Nisqually River has been closed due to fish survival, water quality and disease problems.
- *Discontinued Hatchery Programs:* Dungeness Fall Pink, Garrison Springs Chum, Fox Island Coho and Chinook, Minter Creek Chum and Pink, and Tulalip Bay Spring Chinook hatchery programs have been terminated.
- *Facility Improvements:* Improvements for water quality, rearing and predator control are being implemented to increase success of chinook conservation programs at the Whitehorse and Harvey Creek Facilities on the Stillaguamish.

In support of these efforts and in the midst of severe budget reductions, Governor Gary Locke secured \$1.25M for hatchery reform capital improvements in the 2002 state supplemental budget. He has directed that HSRG's recommendations be used to guide these improvements.

Next Steps

Multiple sources of funding, new partnerships and support from traditional constituencies must be developed to successfully implement hatchery reform. Several of the recommendations will require long term planning and significant financial investments. Others will require changes in management, monitoring and evaluation, or improved methods for tracking success.

By the end of 2003, HSRG will complete the regional review process. Congressional funding in 2003 will provide for:

- Tribal and WDFW science teams, research and implementation of reforms
- HSRG's competitive grant program
- HSRG and facilitation team work to complete the regional review process

Implementation of reform will take place over time, while taking into account changing habitat conditions, water availability, and engineering and funding options. Ongoing implementation will also require integrating hatchery reform with habitat and harvest work at the regional and watershed level to ensure this integration.

- LLTK will continue to assist the co-managers with documenting implementation efforts, communications, strategic planning and constituency building.
- HSRG will continue to provide guidance for the managers on new challenges as they arise in those regions implementing reforms.

Water Action Strategy

The quality and quantity of water in Washington State's rivers, streams and lakes are vital to recovering salmon and addressing other designated uses. Because of the many demands placed on some rivers and streams to meet human needs for water, one of the more difficult challenges is finding ways to restore water to streams where and when it's needed for salmon. In 2001, Governor Locke launched a four-year, statewide Water Action Strategy based on three guiding principles:

- Meet the needs of a growing population and a healthy economy statewide.
- Meet the needs of fish and healthy watersheds statewide.
- Advance these two principles together, in increments, over time.

Purpose: Improve Stream Flows for Fish while Providing Water for Communities

Washington's Water Action Strategy is designed to improve the way water is managed in the state. Elements of the strategy include sponsoring legislation to fix the out-dated water code, taking administrative actions (policies, rules, regulatory actions) where appropriate to improve instream flows, developing comprehensive watershed plans and

regional water management programs, and securing adequate funding to implement needed actions. To meet the needs of people and fish the goals are to:

- Immediately improve instream flows in the 16 critical salmon basins where flows are a limiting factor to the recovery of salmon.
- Develop and implement watershed plans and regional agreements for restoring water needs of fish in these basins in the longer term.
- Ensure that growing communities have reliable supplies, better water management tools, and clear environmental obligations.
- Save and reuse more water.
- Fund and implement plans and strategies that improve water infrastructure statewide.

Structure: State Leadership and Local Planning

The Water Action Strategy is coordinated by the Governor's Water Advisor, and jointly implemented by the Departments of Ecology, Fish and Wildlife, Health, Agriculture, Community Trade and Economic Development, the Office of Financial Management, and the Conservation Commission. State agencies are reaching out to local governments, the agricultural and business communities, tribal governments and environmental organizations to gain valuable input on the tools needed to implement the strategy.

In 1998, the state legislature initiated two locally based programs to develop salmon recovery and water management programs that meet the needs of individual watersheds and communities. These programs are leveraging local government and private funding to implement solutions.

- The Watershed Planning Act authorized development of water management plans by local planning groups that include county and city governments, water purveyors, tribal representatives and private citizens. Watershed plans are currently being developed in 41 of the state's 62 watersheds.
- The Salmon Recovery Act focused on the need to coordinate local action to restore habitat conditions necessary for salmon recovery. Presently, there are 26 local groups working in 45 of the state's watersheds.

Since 1998, the state has provided \$13M to local water management planning efforts under the Watershed Planning Act and \$6.45M to local salmon recovery planning activities under the Salmon Recovery Act. The state participates in these watershed-based programs, providing representation and technical assistance.

Funding and Results: Increasing Instream Flows for Salmon

A Three-Step Strategy for Instream Flows

To recover salmon to healthy and harvestable levels, the State of Washington is committed to ensuring sufficient quantities of water in rivers and streams. The state is currently implementing a strategy to:

- Define the stream flows needed to support salmon and to establish the stream flows in state law as instream flow rules.
- Achieve the identified instream flows through programs to acquire and dedicate water to streams.
- Protect that water once it is in the streams.

Defining and setting instream flows for fish

Washington water law allows the state to develop and adopt rules to define and establish the stream flows needed to protect and preserve fish. Instream flow rules do not affect previously established water rights, but the rules do serve to prevent future degradation of streams and provide targets for stream flow restoration programs. The state has previously established instream flow rules in 19 of 62 watersheds. With the renewed program in 2000, the state adopted an instream flow rule for the Skagit River, which supports all six species of salmon and is the second largest river on the west coast of the country.

The state is actively working with local watershed groups to set instream flows. Sixteen local planning groups have already received state funding grants for this work. The state is implementing a program that will set instream flow rules in 32 watersheds by 2010. To accomplish this objective, the investment in instream flows must continue to rise, peaking in 2005 with 15 rules to be underway concurrently, then dropping off to completion in 2010. The program will define the needed instream flows for mainstem and major salmonid tributaries in the majority of the state's priority salmon recovery basins by 2010.

A total of \$5.2M in state and federal funding has been dedicated to setting instream flows:

- \$2.5 M in federal salmon recovery funding has accelerated instream flow setting in 10 critical basins.
- \$2.7M in state funds has been allocated to instream flow work through watershed planning units.
- Federal funding and existing state funding is being used to establish a Stream Flow Resources Unit that greatly expands the Department of Fish and Wildlife's ability to provide the science and support necessary to achieve flow setting, protection, and restoration for salmonid recovery statewide.

Federal funding will be expended by 2005 and continuation of staffing for the unit is dependent on acquiring additional funding.

Achieving instream flows

The state is implementing a strategy to restore stream flows in the sixteen critical salmon basins. Water is being secured through acquisition of existing water rights to be dedicated to the stream and through improvements in water management and infrastructure that will

also benefit stream flows. Water rights are purchased and leased on a willing buyer—willing seller basis. Once acquired, these rights are placed in the state Trust Water Rights Program to secure and protect the public investment. The state is also partnering with federal agencies; for example, the state is a “qualified local entity” under the Bonneville Power Administration (BPA) water transactions program.

Funding for water rights acquisition has increased:

- In 2000, the state spent \$0.9 M on three transactions.
- In 2001, the investment rose to \$1.54 M spent on 23 transactions.
- Since July 2002, the state has committed \$1.2 M for two transactions to purchase and lease water rights for fish, and a dozen other transactions are under negotiation.

During the 2001 drought, the state purchased and leased water rights in ten different watersheds. Examples include:

- In the Dungeness River watershed, the state leased sufficient water to maintain 50% of the normal stream flow in the river for fish.
- In the mainstem of the Columbia River, water purchase and leases were used to meet flow requirements without having to interrupt agricultural and municipal uses in favor of endangered fish.

With this approach, the state was able to avoid the conflicts between fish and people experienced in other western states.

The state program also provides funding to secure water from conservation projects, source substitution projects, water conveyance improvements, and changes to stormwater management, and other projects that benefit stream flows. The state is supporting new water storage projects that provide multiple instream and out-of-stream benefits.

Total funding for water rights acquisition in the current state biennium is \$6.5M:

- \$3.5M in state funds to acquire water in the 16 critical salmon basins
- \$2M in federal salmon recovery funding
- \$1M from BPA for water acquisition on the Columbia mainstem

Protecting instream flows with stream-gauging and water use metering

Monitoring stream flows is necessary to measure progress toward the instream flow targets. More importantly, this monitoring is necessary to protect water that has been dedicated to the stream and to manage water use in real time. To this end, the state is investing in stream gauging and water use metering. By making this information available to all parties, the state ensures that both water users and water managers can protect stream flows.

Stream-Gauging Funding

- \$1.6M in state funds in the current biennium for enhanced stream gauging in five critical salmon basins.
- \$0.5M in federal funds from BPA for three additional Columbia Basin watersheds
- \$1M in federal salmon recovery funds to expand stream gauging to a total of 12 critical salmon basins by 2004

Required metering and reporting of water use in the 16 salmon critical basins:

- \$3.4M state funds in the current biennium to fund purchase and installation of water use meters

Other Contributing Programs

The state secures benefits for salmon restoration and water management through a coordinated approach to funding of other water-related state programs provides valuable support for salmon restoration and the Water Action Strategy.

Water Diversion Structure and Screening

The state works directly with irrigators and others to provide for the protection of fish put at risk by the operation of surface water diversion structures. This work includes technical support for inventory, design, fabrication, installation, operation and maintenance agreements, and compliance enforcement. Federal funding has greatly accelerated the state's ability to work with water diverters to make these corrections. In most cases, individual projects have required appropriate state or local matches allowing us to further leverage the effectiveness of federal funding.

Federal funds have been allocated during FY 2002 for water diversion structure correction projects:

- \$0.9M for seven to eight projects statewide from the Fisheries Restoration and Irrigation Mitigation Act
- \$0.046 M for 21 sites from Mitchell Act Operations and Maintenance budget
- \$0.134M from BPA for operations and maintenance of 26 sites
- \$0.06M for screen fabrication at three sites from BPA
- \$0.22M to develop action plans at four sites in the Methow basin from BPA
- \$0.16M from the US Fish and Wildlife Service for screening the Foghorn site

Agriculture and Water Conservation

The state has provided \$18M in the current biennium to fund agricultural water conservation projects including both on farm and distribution system efficiencies. The recent federal farm bill also provides additional funding for this purpose.

State funding for on-farm conservation is allocated in two separate parts. The first half provides funding for technical assistance through local conservation districts. This assistance covers the design of irrigation systems on private farms. New, modern

irrigation systems can reduce water application by as much as 50%. The second half of the funding provides a financial incentive to the landowner to install the new irrigation system. State funds will pay for up to 85% of the cost of system implementation. In return for the public funding, the landowner agrees to leave a like percentage of the saved water in the stream (e.g., an 85% cost-share requires 85% of the saved water to be dedicated to instream flow).

Regional and Local Management Initiative

State agencies are working with local participants to develop regional water management strategies in three basins of the state: Central Puget Sound, the Columbia River mainstem and the Yakima River Basin. These initiatives are developing comprehensive water management programs aimed at improving conditions for fish while providing water for economic growth. In the Yakima Basin, state agencies are also pursuing funding for additional water storage and related fish passage improvements. To date, 15 projects have been funded at \$13.9M through the Northwest Power Planning Council (NWPPC) and BPA to improve fish passage and restore habitat.

- State funding for the Central Puget Sound Regional Initiative planning process is \$0.3M.
- The state has allocated \$0.5M for both the Columbia and Yakima planning initiatives.

In addition to these regional initiatives, the state is assisting local participants in the Nooksack, the Dungeness and the Walla Walla basins to conduct pilot Comprehensive Irrigation District Management Plans that will address fish flows, water quality and water resource needs.

Appendix B – Update on Washington State’s Forest Practices Program under the Forests & Fish Report

The Forests & Fish Report (FFR) is a science-based plan for fish habitat and water quality protection on over eight million acres of non-federal forestland in the State of Washington. One of the key objectives of the FFR discussions was for the state’s regulatory best management practices (BMPs) program to meet both the Clean Water Act (CWA) and the Endangered Species Act (ESA). EPA and the Department of Ecology (Ecology) as co-stewards of the CWA, jointly agreed to the goal and FFR was developed in anticipation of colder water quality standards for specific designated uses and revised anti-degradation rules.⁹ With the federal and state agencies’ active involvement, new FFR-based forest practices rules were crafted to ensure forestry did not impair waters, particularly in relation to management-induced heat inputs and sediment that could impact listed native salmonids.¹⁰

EPA and Ecology acknowledged that the FFR, when implemented, will significantly advance forest practices in the State of Washington, improve water quality in the short term, and is anticipated to meet water quality standards in the longer term.¹¹

Given the direct involvement in developing BMPs expressly designed to increase the width of stream buffers to provide shade to address thermal warming of waters and reduce sediment inputs from forestry activities¹² along with required monitoring to ensure compliance, effectiveness, and validation of the new BMPs, the agencies identified that

⁹ See: FFR Policy Group. 2002. *Implementation of the Forests & Fish Report – Progress Update* (December 2001) The report, authored by the active stakeholders involved with FFR, including EPA, updates progress in implementing the FFR over the last calendar year. In a recent letter to WFWA, EPA expressed that the agency is “... *mindful of our support for the Forests and Fish Agreement and are working to ensure that any changes to the state’s water quality standards support the implementation of the Forests and Fish Agreement*”. (Letter dated January 14, 2002 from L. John Iani, Regional Administrator – Region 10 to Bill Wilkerson, Executive Director of the Washington Forest Protection Association).

¹⁰ In Washington State, the Forest Practices Act and rules promulgated thereunder, are the state’s vehicle for implementing Clean Water Act compliance. See RCW 76.09.010(g); RCW 90.48.425.

¹¹ As defined in the CWA, BMPs are practices and measures to control non-point sources and to reduce, to the maximum extent practicable, the level of pollution resulting from such sources. FFR’s BMPs expressly protect the designated uses of native salmonids and will enhance and restore the quality of the water by regulating forest practices to provide cool water by maintaining shade, groundwater temperature flow, and other watershed processes controlling stream temperature, minimizing the delivery of management-induced coarse and fine sediment into streams, and protecting against chemical entry into streams, and maintaining surface and groundwater hydrologic regimes (magnitude, frequency, timing, and routing of stream flow). In addition, FFR will provide for habitat features important to designated uses by providing complex and productive in- and near-stream habitat by recruiting large woody debris and litter.

¹² West of the Cascade crest (Westside), fish habitat streams are regulated with buffers that extend up to a site-potential tree height from the outer edge of the stream or channel migration zone. This distance is 90 to 200 feet, depending on the productivity of the land near the stream. Timber management within buffers is progressively more restrictive in the zones closer to the stream with a no harvest zone of 50’ (specifically providing protection of the stream bank and buffering sediment entry into the stream from upslope activities) and a shade requirement using the approved shade model out to 75’. East of the Cascade crest (Eastside), fish habitat streams are regulated with buffers that extend to at least one site potential tree height from the edge of the stream or channel migration zone, up to 130’. The no harvest zone is 30 feet (specifically providing protection of the stream bank and buffering sediment entry into the stream from upslope activities). The restricted inner zone would extend to 75 or 100’ from the no harvest zone. In addition, where the bull trout overlay occurs, no tree providing shade may be removed within 75’ of the streams.

waters on non-federal forestland had controls on thermal discharges that will address heat inputs that could harm native salmonids.¹³

WFPA fully describes FFR in earlier comments to EPA in response to the first review draft guidance for developing water quality standards for temperature that protect native salmonids (WFPA comments dated February 22, 2002). In addition to the details about the forest practices program described to EPA in earlier comments, it is important to note that FFR-based forest practices are being implemented in the field and refinement of specific protection measures and implementation of administrative requirements of the FFR are ongoing due to the adaptive management program. The following are examples:

- The Forest Practices Board has reaffirmed its commitment to small forest landowners and has appointed a task group to explore small landowner specific issues, such as incentives to stay in forestry and feasibility of alternative plans to meet requirements of FFR in a more cost-efficient manner. In April 2001, legislation was passed which increased assistance available to small landowners wishing to take advantage of the forest riparian easement process.
- The FFR stakeholders and the Forest Practices Board continue to work on the refinements and details necessary for a complete working system of statutes, regulations, funding, and adaptive management to ensure continuous improvement of forest practices as information warrants. The Cooperative, Monitoring, Evaluation, and Research Committee (CMER) is working on scientific studies to answer key questions posed in the adaptive management provisions of FFR. The FPB adopted measurable resource objectives and performance targets and established an independent review process along with clearly defined dispute resolution procedures. State scientists are participating in 50 directed research projects involving species ranging from chinook salmon to tailed frogs. These projects will provide the scientific foundation for possible modifications to forest practices regulations.
- Forestland owners are required to file Road Maintenance and Abandonment Plans (RMAPs) for 20% of their property every year, while explaining how they will bring all roads into compliance within the required 15-year deadline. To date, more than 4700 RMAPs have been filed with the state of Washington.
- Since 2000, large forestland owners have removed more than 400 blocking culverts to comply with FFR. About half of these projects require replacing pipes. In all, we estimate these projects will open up or unblock more than 250 miles of fish habitat.
- Immediately upon approval of the emergency forest practices rules in January 2000 as required by the FFR legislation, stream buffers were significantly expanded on approximately 60,000 miles of water in the State. The buffers, which can range from 75-200 feet depending on stream classification and site conditions,

¹³ See: CH2M Hill. (2000) *Review of the Scientific Foundations of the Forests and Fish Plan*.

had the immediate effect of improving habitat and water quality protection, including temperature, for fish and other wildlife.

- The 2001-2003 biennial budget includes \$20.9 million in funds (\$12.7 million in state funding and \$8.2 million in federal funds) to implement the FFR-based forest practices program. Programmatic elements of the FFR were funding including:
 - Statewide tribal participation in FFR activities;
 - Department of Natural Resources (DNR) and Washington Department of Fish and Wildlife (WDFW) activities to implement the rules and complete the tasks that fall under their purview;
 - DNR, Ecology, and WDFW participation in the adaptive management process;
 - USFWS bull trout research;
 - CMER research-related elements of FFR.



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November 26, 2002

John Palmer
EPA Region X
1200 – 6th Avenue
Seattle, WA 98101

Dear Mr. Palmer:

Weyerhaeuser is generally supportive of EPA's draft guidance for "Pacific Northwest State and Tribal Temperature Water Quality Standards" (2nd public review draft, October 2002). In response to comments many important technical, legal, and policy changes have been made in this draft guidance. The content and tone of the document now seems more appropriate for use by state or tribal governments as they seek to adjust and implement their water quality protection programs.

Weyerhaeuser is a member of the Washington Forest Protection Association, Oregon Forest Industries Council, and the Northwest Pulp and Paper Association. These associations are preparing detailed comments on this draft guidance. We fully support the comments they will be submitting.

EPA is clear in acknowledging the status of this guidance. On page 1 the agency states "...this is a guidance document and not a regulation....It is also important to note that this guidance does not preclude States or Tribes from adopting temperature WQS different from those described here." We have particular interest in two sections of the guidance document where EPA seems somewhat more demanding of States or tribes to implement a desired regulatory outcome.

Section V.3. Adoption of mixing zone provision to protect salmonids

This section gives the appearance of being a prescriptive solution in search of a problem. The apparent premise is that state mixing zone requirements do not (or might not) fully protect salmonids from thermal plume impacts. EPA makes reference to scientific literature results which suggest adverse impacts at moderate temperature/exposure combinations. The recommendation is that states and tribes should revamp their water quality standards to build in these prescriptions.

We have found no conclusive information in the record to suggest that state regulations are deficient in their requirements or implementation. Information submitted by NWPPA in comments on the 1st draft guidance document (and to be resubmitted for this draft) demonstrated that large volume, warm point source dischargers with a properly designed outfall diffuser and permitted under state mixing zone regulatory requirements, will simply not create an adverse thermal impact. NWPPA also submitted information which revealed the scientific weakness of the 21C/migration blockage concern.

EPA should rewrite Section V.3. to provide a more realistic discussion on the efficacy of state mixing zone requirements to avoid thermal plume impacts. Encouragement could be offered that states should closely examine discharge-specific and/or receiving water-specific factors, and then apply provisions of their WQ standards to protect the receiving environment.

Section VI.2. Use of a State's or Tribe's "Natural Background" Provisions, and Section VI.3. Use Attainability Analysis and Numeric Criteria that supports a "Marginal" or "Limited" Use

We found some aspects of these sections to be very confusing. The States of Washington and Oregon have water quality regulations which recognize the concepts of natural conditions or natural background conditions. These states have been grappling with technical and regulatory policy issues germane to the determination of natural conditions. The state regulations include provisions to accommodate human activities when waterbodies are above criteria naturally.

EPA's commentary may add uncertainty or complexity to the regulatory process. Examples include:

- EPA suggests that negligible human impacts are exemplified by water quality in wilderness areas. Washington and Oregon would say that negligible human impacts correspond to "no measurable increase" at the edge of the authorized mixing zone; either 0.3C or 0.25F.
- EPA suggests a need for naturally warm waterbodies above criteria to go through a UAA and formally amend the water quality standards. Washington's Water Quality Standards provides a regulatory mechanism to effectively reset criteria when natural conditions preclude attainment of numeric criteria (WAC 173-201A-070(2)). Washington will not be anxious to undertake a UAA and rule revision when an easier mechanism is available in rule.

The point here is that at least Washington and Oregon have water quality standards which provide mechanisms to address the types of issues presented in Sections VI.2. and VI.3. These water quality standards have previously been reviewed and approved by EPA. EPA should appreciate the individual state regulations and

implementation policies, and not appear to prescribe a uniform approach through this guidance.

Thank you for the opportunity to offer these comments.

Sincerely,

Ken Johnson
Washington Regulatory Affairs Manager

Industry Comments

November 25, 2002

John Palmer
EPA Region 10
1200 6th Avenue
Seattle, WA 98101

Palmer.john@epa.gov

Re: Comments pertaining to the EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards: 2nd Public Review Draft, October 10, 2002

Dear Mr. Palmer:

This letter is written to offer comments during the public comment period for Region 10 EPA, Second Draft of Regional Water Temperature Guidance.

The Idaho Association of Commerce and Industry is a business association that represents approximately 300 Idaho businesses and business associations. Our membership ranges from the largest manufacturing facilities in the state, to individual proprietorships. In Idaho, all of our members--of all sizes-- have a stake in protecting Idaho's water quality.

Many of our member companies are also making comments on the 2nd draft guidance. These comments include technical information specifically targeted to various sections of the temperature guidance document. You will see that there is a great deal of concern about the second draft as it now stands, and that our members and others in Idaho have a great deal of information and expertise to offer in the development of EPA's documents on water temperature. Further, Idaho State and City Governments also are submitting comments of concern.

While we appreciate the action by Region 10 to suspend the first draft, and make certain amendments, many of the comments we made about the first draft still are not resolved.

- We are still concerned about the "closed" nature of the process that developed the temperature guidance. Idaho industry was not involved in the drafting process, and our only input has been to provide public comments about the guidance after it was already written.

- The 2nd draft is not consistent with federal and state law and current national guidance under the Clean Water Act and the Endangered Species Act. Federal law sets guidelines for water quality standards that take into consideration public water supplies, recreation, agriculture, and industry, as well as fish and wildlife. The draft temperature guidance only deals with a small group of aquatic species. There needs to be recognition that salmonids are not the only fish population in Idaho streams, and those other species also require temperature considerations.
- Idaho has already adopted temperature standards for protection of cold water/species, as authorized in the Clean Water Act. The EPA standards are not an improvement. The provisions to protect existing cold water, colder than the numeric criteria, appear to go beyond the Clean Water Act requirements, and therefore beyond what the State of Idaho has authority to regulate. Idaho's specific language on implementing temperature criteria is not consistent with the proposed EPA guidance. Idaho's rules also have provisions for variances from water quality standards to take into account naturally occurring conditions. EPA is not clear on how Idaho would incorporate existing state standards with the proposed temperature guidance, including state mixing zone policy.
- As stated above, the standards ignore Idaho's individual and unique conditions. One result of establishing standards with unreachable numeric criteria is that many Idaho streams and stream segments will be added to the state's 303(d) list, resulting in new, expensive and unnecessary TMDL's.
- Our State Department of Environmental Quality states "Idaho's large low-elevation rivers will not be able to meet the 20°C criterion for migration. This sets up the need for expensive and likely contentious determination of natural temperatures to recognize the simple fact that fish use sub-optimal waters at times." Idaho has already conducted research in water quality to protect salmonids, and we believe our numbers are more realistic than EPA's.
- The guidance is not consistent with the best available scientific and technological information. The facts show that the proposed EPA temperature criteria are not achievable for most streams in the interior Columbia Basin. Further, there is documented evidence that fish do migrate and thrive at temperatures well above the EPA proposed criteria, and that species of concern have existed in Idaho waters for decades. Temperature is not the only criteria impacting salmonid populations and there is no way to know if efforts to reduce temperatures will provide measurable benefits.

- EPA did not include an analysis of the costs to states and the private sector of implementation of these standards. The 2nd draft does discuss the scenario when the criteria cannot be met without causing widespread economic and social impact. However, a solution proposed by EPA, the Use Attainability Analysis, may not be workable in most waters found in Idaho. A better solution would be to set guidance temperatures at more realistic levels.

In summary, we request that EPA Region 10 suspend the proposed 2nd guidance document.

We feel strongly that any document must give Idaho and other states flexibility to deal with local conditions, and must give states the opportunity to utilize the best available scientific information. The EPA document is much more than guidance, and seems to attempt to predetermine state decisions. Any guidance document must also be consistent with the federal clean water act, and take into consideration financial and economic realities for both government and private industry.

Again, I am aware of many more issues of concern that will be discussed in comments by other industry organizations. It is critical that all parties are allowed to be full participants in this process.

Thank you for the opportunity to comment on this guidance document.

Sincerely,

Richard R. Rush
Vice President for Natural Resources

CC: Senator Larry Craig, Senator Michael D. Crapo, Representative Mike Simpson, Representative C.L. "Butch" Otter, Governor Dirk Kempthorne, Lt. Governor Jim Risch, Senator Laird Noh, Representative Bert Stevenson, Senator Robert Geddes, Representative Bruce Newcomb, Mr. Jim Caswell, Mr. David Mabe, Mr. Steve Allred



November 23, 2002

SENT VIA ELECTRONIC MAIL: palmer.john@epa.gov
ORIGINAL TO FOLLOW VIA OVERNIGHT DELIVERY

Mr. John Palmer
EPA Region 10
1200 6th Avenue
Seattle, WA 98101

Dear Mr. Palmer:

Enclosed are the comments that J.R. Simplot Company (Simplot) has on the 2nd Draft EPA Region 10 Guidance for State and Tribal Temperature Water Quality Standards (Guidance). We appreciate EPA's work on revising the earlier proposal. However, the Guidance still has fundamental flaws (legally and technical) that will make the implementation extremely problematic.

1. Conflict with Clean Water Act (CWA)

The draft guidance from EPA is focused on providing optimal temperatures for salmon and trout (in particular bull trout, which prefer very cold water). However, water quality standards must consider many uses of water, just not a specific use for a very limited number of species.

[W]ater quality standard[s] ... shall be such as to protect the public health or welfare, enhance the quality of water and serve the purposes of this Act. Such standards shall be established taking into consideration their use and value for public water supplies, propagation of fish and wildlife, recreational purposes, and agricultural, industrial, and other purposes, and also taking into consideration their use and value for navigation. [33 U.S.C § 1313(c)(2)(A)]

The purpose of water quality criteria is to "protect" designated uses. The CWA does not require that such criteria optimize conditions for specific species, potentially at the expense of other species or designated uses. It needs to be recognized by EPA that other aquatic species, that prefer warmer water, use these same water bodies.

2. Conflicts with State Rules

2A. State Responsibilities.

The CWA provides for states to develop their own criteria. The “Water Quality Standards Handbook” (EPA, 1983) and the “Gold Book” contain EPA’s recommended criteria for standards. Actual standards, as allowed by the CWA, vary considerably from state to state. Thus, for EPA through this guidance, to impose a set of “standards” for temperature is inappropriate. Each state reviews its water quality criteria every three (3) years. At that time, EPA has the opportunity to review and comment on a state’s criteria.

2B. State Standards.

Idaho already has very specific language as to how temperature criteria are implemented. It is not clear at all how the Guidance from EPA fits with existing state rules. For example, section 070.08 allows the Director of DEQ to waive or raise the temperature criteria as they pertain to a specific water body. This provision of the rule recognizes that temperatures in water bodies may naturally vary from the defined standard. This section allows the Director to raise the water temperature criteria for specific water bodies based on a finding that aquatic life will be fully supported at a higher temperature. Federal rules for the temperature criteria for bull trout have the same provision.¹

Section 080.04 recognizes that ambient air temperatures can affect water temperatures. Thus, when the air temperature is considered to be in the top ten percent of the warmest days of the year, water temperatures are not considered a violation if they exceed the standard because the water body is being influenced by naturally “warm” conditions.

Idaho’s rules also have provisions for variances from water quality standards.² There are various reasons why a variance could be granted, which include:

- i. Naturally occurring pollutant concentrations prevent the attainment of the standard; or
- ii. Natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the standard; or
- v. Physical conditions related to the natural features of the water body, unrelated to water quality, preclude attainment of the standard

In summary, Idaho’s rules recognize that water temperature is greatly influenced by natural conditions. As such, exceptions for the applicability of standards or a variance from such standards are provided in the rules. The Guidance provides no clear mechanism to incorporate existing state standards and rules regarding the implementation of such standards.

2C. Interference with State Prerogatives.

Establishment and implementation of mixing zones is the responsibility of the individual states. EPA has made significant changes in the Guidance in regards to mixing zones,

¹ 40 CFR 131.33(a)(3)(ii).

² IDAPA 16.01.02.260.

however further changes are needed. The Guidance should not set criteria, eliminate the use of or state what should be addressed in a state's rules for setting the size and dimensions of a mixing zone. And as described above, the CWA allows states to set the standards for mixing zones. The Guidance does not recognize and acknowledge that this is the domain of the states.

The proposed Guidance does not allow Idaho to utilize fully its own existing approved (by EPA) water quality rules. The Guidance recommends new requirements for mixing zones and effluent limits. However, these new requirements have no basis in any state or EPA mixing zone or NPDES permit program rules or state water quality standards. For example, the State of Idaho has extensive rules that govern the application of mixing zones and temperature criteria.

Idaho's mixing zone policy allows the Department to analyze each specific situation and determine the applicability of a mixing zone based on a scientific appraisal. Idaho's mixing zone policy (Section 060) expressly states that the determination of the applicability of a mixing zone is up to the Department after consideration of numerous factors:³

01. Mixing Zones for Point Source Wastewater Discharges. **After a biological, chemical, and physical appraisal of the receiving water and the proposed discharge** and after consultation with the person(s) responsible for the wastewater discharge, **the Department will determine the applicability of a mixing zone** and, if applicable, its size, configuration, and location. (emphasis added)

Idaho's mixing zone policy makes it clear that the Department (Idaho DEQ) is to determine the applicability of a mixing zone, and if applicable the size, based on characteristics of the receiving water (biological, chemical, and physical). Principles are then given as to guide the size of the mixing zone.⁴ Idaho's mixing zone policy is consistent with guidance from EPA.⁵ EPA states that mixing zones should be looked at on case-by-case basis taking into account:

- ◇ The physical, chemical and biological characteristics of the discharge and the receiving water,
- ◇ The life history and behavior of organisms in the receiving water, and
- ◇ The desired uses of the waters.

Clearly, the Idaho policy and EPA guidance allow DEQ to analyze each specific situation and determine if a mixing zone is applicable based on this evaluation. When doing this evaluation, it is clear that Idaho's rules recognize that accommodations must be made for naturally occurring conditions that raise the temperature of water bodies.

Like Idaho, the State of Washington has rules for mixing zones and for the application of water quality criteria. These rules as pertaining to the temperature criteria of water bodies specifically give allowable increases in water temperature due to point sources

³ IDAPA 16.01.02.060.01

⁴ IDAPA 16.01.02.060.01a-h.

⁵ "Water Quality Standards Handbook," 2nd Edition, EPA, EPA-823-B-94-005, August 1994, p.5-1.

and non-point sources.⁶ The criteria are designed to take into account background temperature. The general criteria is as follows:

(iv) Temperature shall not exceed 16.0 °C (freshwater) and 13.0 °C (marine water) due to human activities. When natural conditions exceed 16.0 °C (freshwater) and 13.0 °C (marine water), no temperature increases will be allowed which will raise the receiving water temperature by greater than 0.3 °C.

Incremental temperature increases resulting from point source activities shall not, at any time exceed $t = 23/(T+5)$ (freshwater) or $t = 8/(T-4)$ (marine water). Incremental temperature increases resulting from nonpoint source activities shall not exceed 2.8 °C.

For purposes hereof, “t” represents the maximum permissible temperature increase measured as a mixing zone boundary; and “T” represents the background temperature as measured at a point or points unaffected by the discharge and representative of the highest ambient water temperature in the vicinity of the discharge.

As an example, specifically for the Snake River below the confluence with the Clearwater River, the following temperature criteria apply:⁷

(a) Below Clearwater River (river mile 139.3). Temperature shall not exceed 20.0 °C due to human activities. When natural conditions exceed 20.0 °C, no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3 °C; nor shall such temperature increases, at any time, exceed $t = 34/(T+9)$.

Washington’s rules recognize that natural conditions affect ambient water temperatures. The rules provide specific methods on how to calculate permissible limits for point and non-point sources under such conditions. The methods utilize a mixing zone for point source discharges. Once again, the proposed Guidance conflicts with the Northwest states’ own approved rules.

⁶ WAC 173-201A-030.(1)(c)(iv).

⁷ WAC 173-201A-130.(98)(a).

3. “Temperature Criteria” Lack Realism

A continuing **MAJOR** flaw in the Guidance, is that the temperature criteria are unachievable for most streams and water segments in the interior Columbia Basin – **PERIOD**.

Actual water quality data show that temperature criteria in the Guidance (criteria) do not reflect actual fish movements, occurrence and behavior. Very viable salmonids populations, including migration of anadromous salmonids, occur at temperatures significantly higher than the proposed criteria.

Readily available water temperature data, though limited for some locales, exist back to the mid-50s for the mainstem Snake River and for certain tributaries (see Appendix A). This data shows a very consistent pattern: the mainstem Snake River and most of its tributaries have historically been “warm” especially in July and August. Mean temperatures often exceed 19 °C for the majority of July and August. Furthermore, these temperatures are prevalent throughout the majority of the length of the Snake River in Idaho for these time periods. And the data also suggest that temperatures today in the mainstem river are similar to what they were over 40 years ago, despite continued development along the Snake River.⁸ There are numerous factors that influence the temperature of the Snake River, but solar radiation (represented by ambient air temperature) is likely one of the most significant factors. Also, stream flow (surrogate for amount of snow pack and when snow pack melts-off) influences water temperatures throughout the summer. There can be no doubt that the warm water temperatures measured in the Snake River are due primarily to naturally occurring conditions.

As mentioned earlier, the proposed criteria are very conservative. One example is the criteria for what temperature allegedly causes “migration blockage” (21 °C, 70 °F) and the temperature for adult salmon migration (20°C, 68 °F).

Examination of adult Chinook passage data through Lower Granite Dam and Ice Harbor Dam from 1990 to 1999 (compiled by Columbia River Basin Research, University of Washington) indicate that passage of Chinook through these two dams occurs at temperatures above 21°C. Review of the past 10 years (1990 to 1999) of sockeye and steelhead passage data at Lower Granite Dam and Ice Harbor Dam parallels the findings for Chinook. Namely, that fish pass through that dams at temperatures in excess of 21°C. Again, this suggests that 21°C may not be a thermal barrier to migrating salmonids, as suggested by the guidance and by USEPA.⁹

⁸ The Snake River is the main “artery” of life for the majority of Idaho, as a considerable amount of Idaho’s population and economic activity occur along or near the river. Thus, activities such as water use for municipal and agriculture purposes does influence water quality, including water temperature. Also, hydropower facilities built on the river do shift the timing of thermal peaks and valleys. However, one would have expected deterioration in water temperature (i.e., warmer temperatures) over the past several decades as development has increased greatly. The data that is available shows that is not the case. This further supports natural factors as having the greatest influence on water temperatures.

⁹ U.S. EPA. 1999. A Review and Synthesis of Effects of Alterations to the Water Temperature Regime on Freshwater Life Stages of Salmonids, with Special Reference to Chinook Salmon. EPA 910-R-99-010.

Also, the proposed criteria fail to account for the acclimation of salmonids to naturally occurring “warm” temperatures. Data from many experiments provide evidence that the temperatures tolerated by salmonids (and other species of fish as well) are a function of three factors:

- ◆ The acclimation temperature;
- ◆ The magnitude of the difference between the acclimation temperature and the elevated temperature; and
- ◆ The duration of exposure to the elevated temperature.

The acclimation temperature is the temperature of the water the fish are living in prior to being exposed to the elevated temperature. The elevated temperature that a salmonid can tolerate increases with increasing acclimation temperature. Chinook salmon acclimated to water at 15.6°C have an upper incipient lethal temperature (UILT) of 24.8°C.¹⁰ For juvenile Chinook acclimated to 24°C, the UILT is 25.1°C.¹¹ Eventually the UILT reaches an upper limit, regardless the acclimation temperature. This is referred to as the ultimate UILT (or UUILT) and is about 25.1°C for juvenile Chinook.¹²

The duration for which a salmonid can tolerate an elevated temperature decreases with increasing temperature. For example, Chinook salmon juveniles acclimated to water at 15°C can tolerate water of 22°C, 23°C, 24°C and 25°C for 62.2 hours, 18.1 hours, 5.3 hours and 1.5 hours, respectively.¹³ The combination of acclimation temperature, upper incipient temperature and duration of exposure to elevated temperatures can be shown on an exposure/acclimation graph. Such figures can be used to identify the “tolerance zone”.¹⁴

As mentioned earlier, historical records show that the salmonid species of concern have existed in the “warm” waters found in Idaho for decades. Thus, such species have definitely adapted to and found ways to acclimate to the temperatures that exist in Idaho streams and rivers. The proposed criteria are rigid and don’t recognize the ability of fish to adapt/acclimate to such temperatures.

¹⁰ *ibid.*, page 41.

¹¹ *ibid.*, page 41.

¹² *ibid.*, page 41.

¹³ *ibid.*, page 42.

¹⁴ *ibid.*, page 42.

Thus, the historical temperature record and known fish behavior data show that the temperature criteria given in the Guidance are unachievable and as such do not represent the true environmental conditions that salmonid species have lived and thrived in historically.

Summary

The Guidance proposed by EPA has too many legal and technical deficiencies to achieve the objective for which it was intended: to mesh the requirements of the Endangered Species Act with the Clean Water Act for Pacific Northwest waters. It is not appropriate for EPA to develop regional temperature criteria that are focused on the optimum life cycle of just a few aquatic species. Furthermore, such criteria lack the “real life” data to be valid. Finally, EPA’s development of regional water quality criteria impedes and interferes with a states’ right to develop and implement its own water quality standards as allowed by the Clean Water Act. ***As such, we believe that EPA should withdraw this Guidance.***

We appreciate the opportunity to comment on this Guidance.

Sincerely,

Dictated, reviewed, and
Sent electronically to avoid delay.

Alan L. Prouty
Director, Environmental & Regulatory Affairs

ALP/njv

Attachment

c: S. Allred	Idaho DEQ
D. Mabe	Idaho DEQ
D. Rush	IACI

APPENDIX A

HISTORICAL WATER TEMPERATURES IN SNAKE RIVER BASIN

A review of water temperature data for waters in Idaho show that the criteria proposed by EPA are unreachable – and based on the length of time that temperature measurements have been recorded – have probably never naturally existed. To illustrate this, below is a discussion of water temperatures in Idaho for over the past 40 years.

Temperature Data – Lower Snake River

The site on the mainstem Snake River with the longest record of temperature measurements is the USGS station near Anatone, Washington (river mile 167.2). This site is upstream of Lewiston, Idaho. McKenzie and Laenen¹ organized data from this site and others in a compilation of temperature data on the Columbia and Snake Rivers.²

This data clearly shows that temperatures in the Snake River upstream of Lewiston have been typically greater than 19.0 °C during the summer during the entire history of this station (see Table1). An examination of the data shows that August mean temperatures range from 20.4 to 23.0 °C (Figure 4) with no apparent trend. The duration of temperatures greater than this value range from 45 to 97 days. Clearly, the Snake River in this section of the river is “warm” during the summer and most likely has always been.

¹ McKenzie, S.W. and A. Laenen, “Assembly and Data-Quality Review of Available Continuous Water Temperatures for the Main Stems of the Lower- and Mid-Columbia and Lower-Snake Rivers and Mouths of Major Contributing Tributaries.”

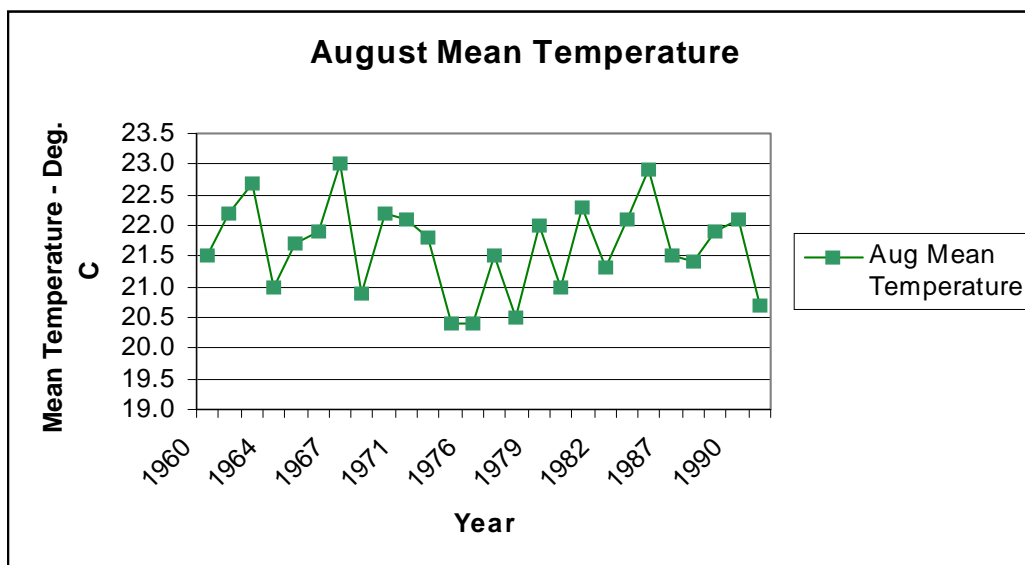
² www.streamnet.org/subbasin/Crbtdata.html

Table 1
Snake River Temperatures at Anatone, WA

Year	Mean Temp				No. of Days Mean Temp > 19.0 C
	June Deg C	July Deg C	Aug Deg C	Sep Deg C	
1960	16.4	22.5	21.5	19.3	77
1961	17.5	22.8	DM	19.5	95
1962	15.4	20.6	22.2	19.4	75
1963	16.0	20.6	22.7	21.0	89
1964	14.3	19.9	21.0	18.1	56
1965	13.8	19.7	21.7	17.4	58
1966	DM	22.3	21.9	20.0	DM
1967	14.0	20.7	23.0	21.8	83
1968	16.1	21.4	20.9	DM	65
1969	DM	DM	DM	DM	DM
1970	14.7	20.6	22.2	17.7	65
1971	13.4	18.9	22.1	18.2	60
1972	14.2	20.4	DM	18.9	69
1973	16.5	20.8	21.8	18.7	66
1974	12.5	17.4	20.4	18.8	47
1975	DM	DM	DM	DM	DM
1976	13.7	19.4	20.4	19.3	64
1977	17.9	20.3	21.5	18.1	76
1978	14.1	18.7	20.5	18.0	46
1979	15.4	21.0	22.0	20.3	85
1980	15.0	20.1	21.0	19.1	70
1981	14.8	20.4	22.3	19.7	75
1982	13.3	17.9	21.3	18.9	52
1983	14.9	18.3	22.1	18.7	58
1984	DM	DM	DM	DM	DM
1985	DM	DM	DM	DM	DM
1986	17.8	21.0	22.9	DM	86
1987	18.2	20.7	21.5	20.4	97
1988	17.2	20.9	21.4	19.0	83
1989	16.3	21.8	21.9	19.7	84
1990	16.0	21.6	22.1	21.0	95
1991	DM	DM	DM	DM	DM
1992	DM	DM	DM	DM	DM
1993	14.9	18.2	20.7	18.6	45

DM = data
missing

Figure 1
August Mean Temperatures – Anatone, WA Station



A more recent study has involved once a week temperature measurements taken at River Mile 144 from mid-July through mid-October.^{3,4} Data from 1997 and 1998 show average temperatures in the Snake River at 21.2 °C and 22.0 °C respectively.

Temperature Data - Hells Canyon

Data on temperatures in Hells Canyon as been collected sporadically over the past four decades. The data is primarily from two periods, 1950s through 1973 and 1991 through 1995. The data is from various locations in Hells Canyon. The sources of data include USGS information as organized by McKenzie and Laenen³⁶ and Idaho Power Company documents. For this review, only several sites will be examined.

The USGS operated a station 3.8 miles downstream of Oxbow Dam (River Mile 269.6). Data from that station (Table 2) shows temperatures not that different from the Anatone Station. Other temperature data includes data gathered by Idaho Power, USGS and Idaho Fish and Game.

³ Klotwyk, N., "1997 Receiving Water Monitoring Program Report," Potlatch Corporation, June 30, 1998.

⁴ Klotwyk, N., "1998 Receiving Water Monitoring Program Report," Potlatch Corporation, June 30, 1999.

Table 2
Snake River Temperatures at Oxbow, OR

Year	Mean Temp				No. of Days Mean Temp > 19.0 C
	June Deg C	July Deg C	Aug Deg C	Sep Deg C	
1959	16.9	19.9	DM	20.4	87
1960	17.0	19.1	21.5	20.1	72
1961	DM	21.0	DM	DM	100
1962	17.5	19.1	21.1	20.4	76
1963	17.7	DM	DM	21.5	100
1964	17.1	19.7	21.2	19.2	71
1965	17.5	19.9	21.9	19.3	72
1966	16.6	18.7	DM	21.1	69
1967	16.5	DM	21.5	22.2	93
1968	16.2	18.6	20.6	18.4	35
1969	17.9	DM	DM	20.2	DM
1970	15.8	19.4	21.2	17.8	65
1971	16.4	19.0	21.9	20.3	68
1972	18.5	19.6	21.1	19.7	84
1973	16.5	DM	DM	DM	DM

DM = data
missing

USGS had extensive water temperature monitoring in the mid-Snake River in the 1950s.⁵ The U.S. Fish and Wildlife Service. Also summarized this data^{6,7} Idaho Power has collected temperature data at times during the construction and operation of the multi-dam complex in Hells Canyon.^{8,9,10} Idaho Fish and Game also gathered some temperature data during an investigation of fisheries in the Brownlee and Oxbow reservoirs.¹¹

⁵ Moore, A.M., "Compilation of Water-Temperature Data for Oregon Streams," USGS, November 1964.

⁶ U.S. Fish and Wildlife Service, "A Preliminary Progress Report on Air and Water Temperature Studies, Middle Snake River Drainage, 1954-1956," May 1957.

⁷ U.S. Fish and Wildlife Service, "A Progress Report on Air and Water Temperature Studies for 1957, Middle Snake River Drainage, April 1958.

⁸ Beattie, G. (CH2M HILL) correspondence to A. Prouty (Potlatch Corp), March 2, 2000.

⁹ Moore, H.R., Idaho Power Company, March 21, 1961.

¹⁰ Idaho Power Company, "Brownlee-Oxbow Project 1971, Fish Counts and Operational Data 1959-1963."

¹¹ Webb, W.E., "General Investigations in Water Quality," Idaho Fish & Game Department, June 15, 1962.

Table 3
Snake River Temperatures in Hells Canyon

Location	River Mile	Year	Source	Mean Temperature (Deg C)			
				June	July	August	September
Pittsburgh Landing	216.5	1995	IPCO, USFWS		20.6	21.3	20.6
		1994	IPCO, USFWS	16.6	19.9	21.8	20.6
		1993	IPCO, USFWS	16.6	18.6	20.5	19.3
		1992	IPCO, USFWS	15.8	19.1	20.4	19.3
Snake River	239	1995	IPCO		20.4	21.2	20.6
		1994	IPCO	16.4	19.7	21.7	20.7
		1993	IPCO	16.4	18.4		
		1992	IPCO		18.6	20.0	19.3
Hells Canyon Dam	246	1995	IPCO, USFWS			21.1	21.0
		1994	IPCO, USFWS	16.3	20.4	22.0	22.1
		1993	IPCO, USFWS	17.0	18.9	20.7	19.9
		1992	IPCO, USFWS	14.3	18.9	20.4	19.8
Oxbow	270	1954	USGS	17.8	23.9	21.1	17.8
	270	1955	USGS	18.9	22.2	22.8	18.9
	270	1956	USGS	17.8	24.4	22.2	19.4
	270	1957	USGS	18.9	22.2	21.7	18.3
	270	1958	USGS	18.3			20.6
	270	1959	USGS	16.7	20.0	21.1	20.6
	273	1959	IPCO			20.7	19.3
	273	1959	IPCO	16.3	19.0	20.8	19.4
	270	1960	USGS	16.7	18.9	21.7	20.0
	273	1960	IPCO			20.8	20.2
	273	1960	IPCO	16.1	18.3	20.7	19.1
	270	1961	USGS	18.9	21.1	22.2	
	Varies	1961	IFG			22.8	
	273	1961	IPCO	17.5	18.5	21.2	20.2
	270	1962	USGS	17.8	18.9	21.1	20.6
	273	1962	IPCO	16.8	20.1	21.6	19.8
	273	1963	IPCO	18.1	20.6	21.6	20.9
Brownlee	285	1957	USGS	17.8	21.7	20.6	17.8
	285	1958	USGS	16.7	19.4	21.7	18.3

	285	1959	USGS	15.0	18.3	20.0	18.9
	285	1959	IPCO			19.6	19.0
	285?	1959	IPCO	20.7	23.6	23.6	18.8
	285	1960	IPCO			21.3	19.6
	285?	1960	IPCO	20.7	25.0	24.7	20.8
	Varies	1961	IFG	23.3	25.5	25.2	18.5
	285?	1961	IPCO	22.0			
	285?	1962	IPCO	19.1	23.8	23.4	24.8
	285?	1963	IPCO	20.4	22.9	25.0	23.3

As with the temperature data from the Lewiston area, the temperature of the Snake River through Hells Canyon has always been warm during the summer.

Temperature Data – Mid and Upper Snake River

The Corps of Engineers undertook a very comprehensive review of water quality and fisheries in the Snake River basin in the mid-late 1970s.¹² This review looked at water withdrawals from the Snake River, water quality, pollution loadings and fisheries along the Snake River from the mouth to Jackson Lake (Wyoming). Some temperature data was presented in this report and is described below.

Generally, water temperatures in the upper Snake River are below 20 °C. With most of this area being at relatively high elevations (the elevation at the mouth of the Henrys Fork is approximately 4800 feet), cool water temperatures would be expected. Maximum river temperatures measured for a one year period were 16.0 °C at Heise (river mile 854) and 17.6 °C at Alpine (river mile 918).¹³ The range of temperatures at Alpine (located at Wyoming/Idaho border) is from 0 to 20 °C, with the peak temperature occurring in late July and early August. Typically temperatures are less than 19 °C.¹⁴

Further downstream from the mouth of the Henry's Fork, temperatures in the Snake were characterized as being moderate and at desirable levels for a salmonid fishery. Maximum temperatures at Milner Dam (river mile 640) and King Hill (river mile 547) were 21 and 20 °C respectively.¹⁵

Warming of the Snake River between King Hill and Weiser was reported.¹⁶ Maximum temperature at Swan Falls was given at 24.5 °C and at Weiser 26.5 °C. It was reported that for the preceding five (5) year period, temperatures in this stretch of the Snake River exceeded 21 °C between 9 and 16 weeks a year.

¹² Bennett, D.H., C.M. Falter, and R.G. White, "Environmental Review of the Snake River and Selected Tributaries," in Columbia Basin Water Withdrawal Environmental Review, Appendix-D-Fish, Part II, Snake River, U.S. Army Corps of Engineers, November 1979.

¹³ *ibid.*, page 20-22.

¹⁴ *ibid.*, page 279.

¹⁵ *ibid.*, page 55-56.

¹⁶ *ibid.*, page 105.

Beattie summarized other data in the mid and upper Snake River.¹⁷ Typically in July temperatures throughout most of the mid Snake are above 18 °C (see Table 4). In August, mean temperatures are usually close to or above 20 °C, with the exception being the upper Snake River. Temperatures near Blackfoot and further upstream are cooler. Temperatures begin showing significant cooling in September, most pronounced highest in the basin. This is not too surprising as ambient air temperatures in the mountains of eastern Idaho drop considerably beginning in September.

¹⁷ Beattie, G. (CH2M HILL) correspondence to A. Prouty (Potlatch Corporation), March 2, 2000.

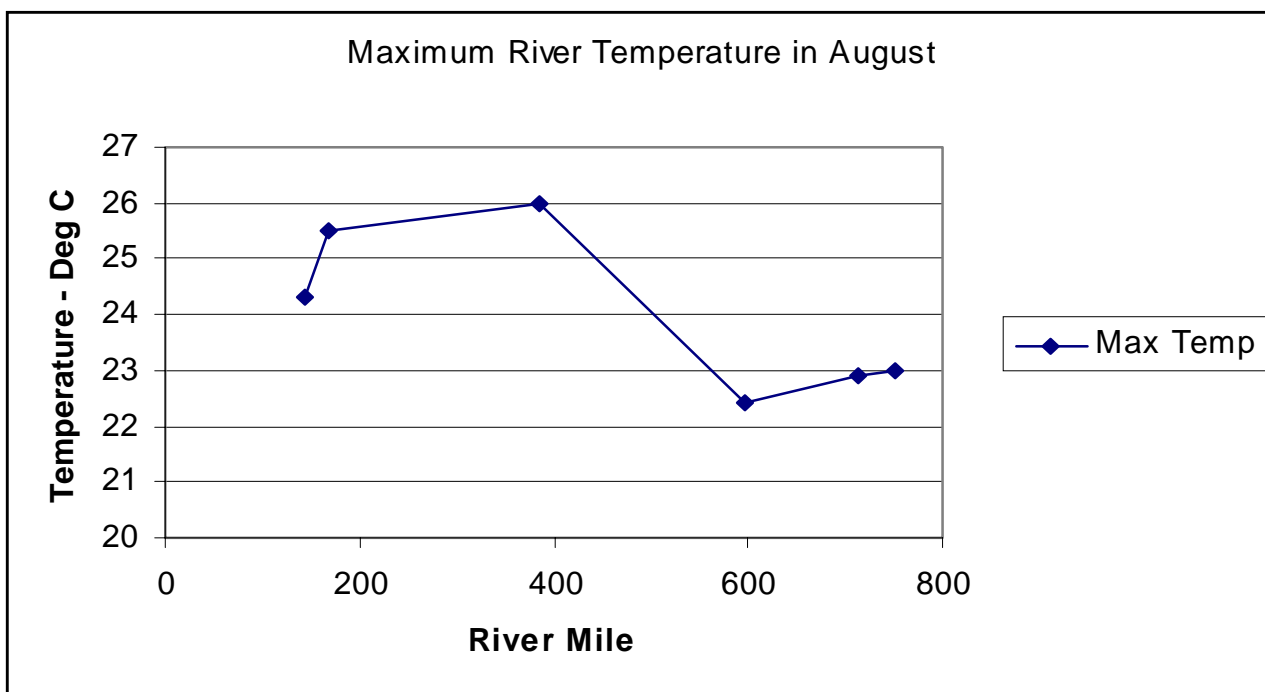
Table 4
Water Temperatures in the Mid and Upper Snake River

Location	River Mile	Year	Source	Mean Temperature (Deg C)			
				June	July	August	September
Nyssa	385	1998	USGS	18.7	23.5	22.9	20.0
		1997	USGS			22.1	19.1
Buhl	597	1998	USGS	16.8	21.3	20.1	18.0
		1997	USGS	18.5	18.9	19.3	18.1
		1996	USGS		20.3	19.0	15.6
Twin Falls	608	1999	IPCO	18.7	19.9	20.5	16.7
		1998	IPCO	17.0	22.3	21.5	19.0
		1997	IPCO	18.9	20.4		
		1996	IPCO	18.1	20.9	19.9	16.1
American Falls	714	1995	IPCO		21.2	20.4	
		1999	IPCO	14.9	18.7	20.7	17.1
		1998	IPCO	14.7	19.8	21.6	19.8
		1997	IPCO	16.7	18.6	20.2	18.8
		1996	IPCO	15.3	18.9	19.7	16.8
		1995	IPCO	13.8	18.1	19.8	18.4
		1994	IPCO	16.5	20.6	21.9	16.7
		1993	IPCO	14.6	17.2	19.2	18.1
Blackfoot	750	1992	IPCO	17.2	18.6	19.9	14.3
		1998	USGS	13.7	18.7	19.4	17.0
		1996	USGS	15.2	19.0	18.1	14.3
		1994	USGS	17.9	18.8	19.4	16.9
Heise	854	1996	USGS			14.8	14.6

Figure 2 shows maximum river temperatures in the mainstem Snake from Blackfoot to Lewiston for August of 1998.¹⁸ The temperature seems to climb as the river passes through southern Idaho and then begins to drop as it heads through Hells Canyon.

¹⁸ Data taken from 1998 Potlatch River Study at Lewiston, 1998 USGS data at Anatone, Nyssa, Buhl and Blackfoot, and 1998 data from Idaho Power at American Falls.

Figure 2
Maximum Snake River Temperatures – August 1998



Tributary & Headwater Temperatures

A review of a limited amount of tributary and headwater temperature data shows that often, the tributaries and their associated headwaters have warm temperatures in the summer. A few selected tributary temperatures are given in Table 5.

The Clearwater River, prior to the completion of Dworshak dam often had temperatures in the summer greater than 20 °C. One of streams in the Clearwater River basin, the Lochsa River, recently underwent a sub basin assessment. The assessment showed that the Lochsa River “regularly exceeds the temperature criteria, but that these temperatures are natural conditions in the sub basin.”¹⁹ Temperatures of the Lochsa near the confluence with the Selway River showed mean values of 21.2 and 19.8 °C for July and August. The sub basin data also showed that the Lochsa and its associated tributary streams had a propagating, balanced indigenous population of aquatic life.

¹⁹ Bugosh, Nicholas, “Lochsa River Sub basin Assessment”, Idaho Division of Environmental Quality, September 1999, p.55.

Table 5
Selected Tributary Temperatures

Tributary	Location	Year	Source	Mean Temperature (Deg C)			
				June	July	August	September
Payette River	Payette	1998	USGS		23.8	21.6	20.2
	Cascade	1998	USGS		20.1	21.5	19.2
	McCall	1998	USGS	14.2	21.2	22.0	18.9
Weiser River	Weiser	1998	USGS		23.7	22.1	20.2
	Weiser	1997	USGS			22.0	19.0
	Council	1957	USFWS	15.2	20.2	19.0	15.7
Boise River	Twin Springs	1998	USBR	10.6	17.5	19.0	16.6
	SF Boise	1998	USBR	9.7	16.3	17.9	15.7
Portneuf River	Pocatello	1998	USGS	14.8	21.9	20.2	17.0
	Pocatello	1996	USGS	17.1	21.2	19.5	16.5

The Weiser River drainage has shown elevated temperatures for decades. Temperature data collected in 1957 showed maximum temperatures of the Weiser River near the confluence with the Snake River above 26 °C.²⁰ In fact, at times the minimum temperature recorded in July was 26.9 °C. Daily mean temperatures further upstream on the Weiser River near Council, ID were typically between 18.9 and 21.1 °C. More recent monitoring data shows that some of the headwater streams of the Weiser River still have temperatures similar to those measured in 1957.

The Payette River, like the Weiser River has shown high temperatures during the summer. In fact, even at McCall in 1998, water temperatures in July and August were typically greater than 20 °C.

Data from other drainages, such as the Jarbridge, Owyhee and Lemhi show very wide ranges of temperatures during the summer. Some of the streams in these sub basins have very moderate summer temperatures (mean temperatures of 14 to 18 °C) while others have maximum temperatures that approach or exceed 25 °C. In fact, in the Owyhee drainage, temperatures up to 29 °C have been documented with native redband trout populations.²¹

²⁰ "A Progress Report on Air and Water Temperature Studies for 1957, Middle Snake River Drainage," U.S. Fish and Wildlife Service, April 1958.

²¹ Zoellick, B.W., "Stream Temperatures and the Elevational Distribution of Redband Trout in Southwestern Idaho," Great Basin Naturalist 59(2), 1999, p.136-143.



November 26, 2002

John Palmer
EPA Region 10
1200 6th Avenue
Seattle, WA 98101

VIA EMAIL – palmer.john@epa.gov

RE: REGION 10 GUIDANCE FOR STATE AND TRIBAL TEMPERATURE WATER QUALITY STANDARDS

Dear Mr. Palmer:

The Northwest Food Processors Association is a regional trade association representing fruit, vegetable, dairy, poultry and specialty food processors in Idaho, Washington and Oregon. Food processing is the largest manufacturing employment sector in the State of Idaho and the second largest in the states of Washington and Oregon. Food processors have a vested interest in this guidance since many are direct dischargers under the NPDES program and a significant number are indirect dischargers through permitted municipal discharge programs.

In February of 2002, NWFPFA filed comments on the first draft of this guidance. At that time we asked the agency to withdraw the guidance from consideration. However, the agency chose not to withdraw the guidance and instead attempted to re-draft the proposal and attempt to eliminate potential legal challenges to the validity of the guidance.

By so doing, the EPA completely ignored the underlying problems associated with this misguided and flawed guidance document. We still believe the document is a rule disguised as guidance. At the public workshop held in Portland, it was very apparent that the Fish and Wildlife Service and NMFS intend to utilize the requirements of this guidance in their consultation process. How can a guidance document not be a rule if states and permittees are required to follow the guidance to have any hope of successfully completing consultation?

The proposed guidance goes well beyond the Regional offices authority and the authority of the Clean Water Act. This problem was well explained in numerous comments your agency received on the first draft, including those of NWFPFA. In addition, EPA has done absolutely no analysis on the impact of this guidance on EPA's own permit program or to delegated states. The agency has not done any research on the projected number of stream segments that would potentially be declared impaired due to the unreasonably low temperature requirements in this guidance.

Adopting a standard such as this will be devastating to state TMDL programs that are already straining against serious budget constraints and numerous legal challenges. Adding to that burden, without any net environmental benefit nor any concept of the consequences is unreasonable, arbitrary and capricious.

Finally, EPA has sold this guidance document to the states and permittees as a vehicle to assure success in the Section 7 consultation process. Statements by representatives of both NMFS and the Fish and Wildlife Service at the public hearing in Portland make it clear that such an assurance is not valid and in fact was never an intended outcome. States that adopt this guidance will not receive a streamlined consultation process. They will simply open themselves to legal challenges from all sides who will dispute the science and the process used to set the standards.

We are disappointed that EPA Region 10 chose to go forward with this guidance document. It is unworkable and unacceptable. We respectfully request that EPA withdraw this proposal.

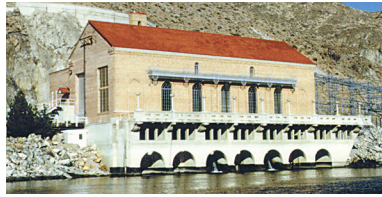
Thank you for the opportunity to comment on this proposed guidance.

Sincerely,

A handwritten signature in black ink, appearing to read "Craig Smith", with a stylized flourish at the end.

Craig Smith
Environmental Consultant
Email: csmith@nwfp.org
Phone: (503)371-3123

Hydroelectric Comments



PUBLIC UTILITY DISTRICT NO. 1 *of* CHELAN COUNTY

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November 26, 2002

Mr. John Palmer
ENVIRONMENTAL PROTECTION AGENCY
Region 10
1200 Sixth Avenue
Seattle, WA 98101

Subject: Response to Comments on EPA Temperature Guidance Criteria

Dear Mr. Palmer:

The Public Utility District No. 1 of Chelan County (Chelan PUD) appreciates the opportunity to provide comments on the October 10, 2002, 2nd Public Review Draft of EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards (Guidance). Chelan PUD has an interest in the methods used to establish water quality criteria, both as a regulated industry and as a public agency that promotes the protection and restoration of healthy, sustainable fish populations. Chelan PUD supports water quality standards (WQS) that improve biological outcomes for fish and protect existing beneficial uses of waters. Chelan PUD recognizes that EPA Region 10 and the cooperating agencies that participated in the development of the Guidance have conducted an exhaustive review of the relevant scientific literature to determine the temperature regimes that are optimally supportive of these cold-water fish species. Chelan PUD believes that the Guidance's temperature criteria are unrealistic and unachievable in many cases. Chelan PUD commented on those issues on February 25, 2002, in response to the first draft of the Guidance. Chelan PUD's other main issues with the Guidance relate to the application of these criteria to water bodies where natural conditions and/or irreversible human effects related to existing beneficial uses prevent attainment of the WQS and numeric criteria. Chelan PUD's comments in this letter will focus on the issues regarding application of the Guidance, rather than the choice of the temperatures assigned to the specific numeric criteria.

The Guidance should avoid requiring the states and tribes to adopt temperature criteria that are more stringent than natural temperatures

The Guidance provides ample scientific evidence for temperature ranges that are preferred by the different species of salmon, trout and char. However, the Guidance still fails to adequately deal with the known fact that salmonids occupy habitats that provide less than ideal conditions. In fact, the natural temperature regimes in many streams used by rearing salmonids are warmer than the temperature criteria provided in the Guidance. The guidance proposes to apply even more stringent cold water temperature criteria than are used in the current state and tribal WQS, but fails to provide meaningful improvement in the cumbersome process of establishing site-specific criteria that match natural temperature regimes. The Guidance alludes to the ability of states to adopt subcategories of uses and to adopt seasonal uses, however the Guidance provides no practical improvement in the methods states and tribes must use to establish these subcategories of use. The net effect of establishing numerical criteria that are not reflective of natural conditions or irreversible human effects will be to require the states and tribes to establish water quality standards that cannot be complied with under any reasonable circumstance. Temperature criteria that are

more stringent than natural conditions and do not take into account irreversible human effects will place roadblocks to socially desirable new human activities and fundamentally impair existing beneficial use of waters for a wide variety of purposes.

The Guidance should correct this problem by improving and simplifying the methods available to the states and tribes for dealing with natural limitations and irreversible human effects. As a first step, the Guidance should allow the states and tribes to limit the application of temperature criteria to those stream segments where it is feasibly attainable without impairing existing beneficial uses. This could be done through stream segment categorization based on elevation and climatic zone. Also, the Guidance should provide the states and tribes with improved and simplified processes for setting site-specific criteria and seasonal use designations in their WQS.

The Guidance should not base the application of temperature criteria on the "furthest downstream extent of use" to naturally warm stream segments and tributaries

As previously mentioned, salmonids routinely use habitat that does not meet the temperature criteria, even in the absence of human effects. Thus, the furthest downstream extent of use will always include extensive area in stream segments and waterbodies that never did, and never will, have water temperatures in summer that meet the temperature criteria proposed in the Guidance. The earlier draft of the Guidance discussed the concept of "site-potential" as a means to set realistic temperature criteria for naturally warm stream segments. While this may have been a costly and unmanageable concept for incorporation into WQS in the original form described in the first draft of the Guidance, the concept should have been given greater consideration in the formulation of the simplified process in the current draft Guidance. Application of the Guidance's numeric criteria to all areas used by salmonids will result in unnecessary listings of stream segments on the 303(d) list and unreasonable expectations in TMDL processes where "reasonable assurance of meeting WQS" will not be possible due to natural temperature conditions or irreversible human effects related to existing beneficial uses. The Guidance devotes considerable discussion about the potential that current distribution of salmonids is less than it was historically because of temperature degradation and other affects of human development. This may be the case in some areas, but it is also true that where healthy, sustainable populations of salmonids exist, they occupy all habitat that is available. This available habitat includes year-round use in some warm habitat areas that can't meet the criteria and seasonal use in other stream segments, including intermittent streams. The designation of boundaries for salmonid use classifications and water temperature criteria should be based on the water temperatures achievable at the site, not the furthest downstream location of salmonid use.

The Guidance should improve the utility of the salmonid use habitat classifications in Table 3 by relating the definition of these areas to measurable physical parameters that can be used to establish stream segment boundaries for these uses

The guidance provides for selective use of summer maximum criteria of 16°C, 18°C and 20°C in areas with use designations of "salmon/trout "core" juvenile rearing, juvenile rearing and juvenile/adult migration and migration on lower mainstem rivers". This simplified approach to the site-potential concept could be useful, but the determination of the boundaries must be based on physical factors that determine stream temperatures, not furthest downstream extent of use. The boundaries could be set based on geographic determinants. This would allow for a broad-brush approach to establishing some level of site-potential realism to numeric criteria for lower elevation stream segments in arid climatic zones. In reality, salmonids routinely rear in rivers that have summer maximum temperatures that exceed 18°C for extended periods of time due solely to natural conditions. The Guidance needs to better define where and how the states and tribes can designate these categories of salmonid use in their WQS and base the boundaries on geographic estimators of site-potential water temperatures.

The Guidance should improve the 20°C salmon and trout migration use designation to truly reflect site-potential limitations that exist in the Columbia River and the lower mainstem of some tributaries. The use of this classification should not be tied to narrative standards related to hypothetical thermal refugia.

The reality of river basin site-potential temperatures in many streams of the Columbia Basin is that peak summer water temperatures will exceed 20°C. This is a result of natural geographic and climatic conditions, not a result of

human activities. Human activities can increase the frequency and duration of peak temperatures, but the ultimate thermal equilibrium in these rivers and streams is primarily a function of elevation and climate. Human activities did not remove riparian canopies or destroy thermal refugia that never existed. The Guidance should define the application of this salmonid use designation based on geographic and climatic parameters and the numeric temperature criteria should be based on actual peak historical summer temperatures recorded in the Columbia River and lower reaches of the major tributaries, coupled with geographic and climatic information. Although human activities have had substantial affects on some rivers, there are sufficient river basins with far less human impact to thermal properties to allow for estimation of site-potential in general based on elevation, climate and river size. Setting realistic temperature criteria in WQS for these stream segments will facilitate setting meaningful goals for TMDLs and the collaborative development of watershed restoration plans. Unrealistic and unachievable temperature criteria will only result in years of conflict and litigation with no biological benefit to salmonids.

The Guidance places a great deal of stock in the existence of thermal refugia as a normal aspect of watershed hydrology. The universal existence of thermally buffered groundwater flows into riverbeds is an assumption, not a fact. The Guidance draws from the Return to the River report (2000) in its description of presumed alluvial floodplain groundwater exchange. The Return to the River (2000) report is predominately speculation and particularly devoid of empirical evidence regarding the applicability to the Columbia River of the "beads on a string" concept of alluvial return flows creating thermal refugia. While it is important that WQS protect thermal refugia where they exist, the application of realistic temperature criteria to the lower elevation stream segments should not be contingent upon finding or attempting to create thermal refugia.

The Salmon/Trout spawning, egg incubation and fry emergence temperature criterion is unnecessary and the time frame established for its application is inappropriate

The initiation of spawning by salmon (fall spawners) is timed to coincide with the average water temperature regime that promotes egg survival and proper emergence timing for fry the following spring. This trade-off between best temperature for spawning and best temperature regime for incubation and emergence is a naturally variable parameter. In some years, the earliest spawners may have better emergence timing (such as when the winter incubation temperatures are colder than average), while in other years the fish spawning later may have the most advantageous emergence timing. It is obvious that emergence timing is a highly selective variable, otherwise fish populations would respond to selection pressure by delaying the timing of spawning to later in the year when water temperatures have always cooled to the optimum. The response of salmon populations to variability in the spawning and incubation environment is that some portion of the population initiates spawning when water temperatures are still warmer than optimal. This provides insurance for the population against the potential adverse survival affects of either abnormally cold water temperatures within the first forty days of incubation (prior to blastophore closure) or late hatching and emergence during years with extended periods of very cold water. Similar adaptations of trout populations (spring spawners) also govern the initiation of spawning, although warm water temperatures fall at the end of the incubation period for these species. Again, the timing of emergence is a critical variable in the survival of progeny and success of the population.

The fish spawn when it is appropriate for the location and river system, based on temperature patterns that have been in effect for the past several decades. The cooling of water temperatures in the fall is largely governed by the variations in fall weather, both in terms of air temperature and rainfall. Thermally buffered rivers, which are influenced by lakes and reservoirs, may have fish populations that spawn later in the year than would be the case if there were no lake or reservoir, but the winter water temperature is also buffered during the incubation period. Fish populations that spawn in these rivers are likely to be either adapted or adapting to the buffered temperature regime. Separate water temperature criteria are not necessary to protect these spawning populations, except perhaps where major changes to the existing temperature regime are anticipated. In these cases, application of EPA and State anti-degradation policies would require the prevention of harm to existing fish populations.

The use of "the average date that spawning begins to the average date incubation ends" as the date for application of a spawning temperature criterion is inappropriate. As previously stated, fish populations respond to natural variability in the temperature regime during spawning and incubation by spreading the timing of spawning activity over a broader range of dates. Thus, some fish in a healthy population will always spawn earlier than the date when temperatures cool to the optimum range (fall spawners). Some spring spawning fish will initiate spawning later than

the "average" individuals in the population, with incubation continuing into warming temperatures that may be warmer than the criterion in years with early, warm summer temperatures. Again, establishing separate temperature criteria for spawning and incubation is unnecessary because healthy fish populations will always include individuals that don't follow the rules.

The steelhead smoltification temperature criterion is unnecessary and inappropriate

Steelhead smolt outmigrations are governed mostly by river flow levels, which can be delayed in years with cold spring weather or may never develop in years with severe drought. Tributary flows and stream temperatures are somewhat linked. In years with normal snowpacks, warm temperatures in spring and early summer create higher streamflows from melting snow that both encourage steelhead to migrate and also keep water temperatures from becoming too warm. If steelhead smolts fail to migrate in the normal time frame or residualize due to low flows, they may later experience warmer water temperatures. However, the cause of the migration failure is more likely due to the lack of a spring runoff flow increase than due to temperature conditions, both in the tributaries and in the Columbia River. Drought conditions are the most common cause of delayed steelhead smoltification and migration, with resultant increases in the rate of residualism. The adoption of temperature criteria for steelhead smoltification does not address the real cause of migration failure and therefore unnecessary.

The Guidance should develop more detailed and flexible approaches to address situations where EPA's recommended numeric criteria are inappropriate or unachievable

The numerical criteria in the Guidance are "near the warm end of the optimal temperature range for the salmonid life stage uses the criteria are designed to protect". As previously stated, healthy populations of salmonid don't limit their exploitation of available habitat to just those that provide the optimal temperature range. Therefore, by EPA's own definitions of use categories, there will be innumerable stream segments that support existing or potential use by rearing salmonids but that can't achieve the numeric criteria recommended by EPA. This places the states and tribes in the unproductive situation where their WQS are patently biased against any human activities, including existing beneficial uses, and the numeric criteria are unrealistic and unsupported by hydrologic and thermodynamic principals in science. The solution is either to raise the temperature criteria to be more inclusive of natural thermal regimes or provide for a simpler method to match temperature criteria to site-specific thermal potentials. The current Guidance does nothing to assist in rectifying this problem, rather it makes it even worse by recommending temperature criteria that are less attainable than current state and tribal WQS.

The Guidance should include an approved, facilitated methodology for states and tribes to follow when designating site-specific numeric criteria or designating stream segments for sub-categories of use by salmonids. Stream habitats with less than optimal temperature regimes are abundant and important for salmonids, but also are often the most important stream segments for human activities. The Guidance serves neither salmon nor society by promoting numeric temperature criteria that are infeasible to achieve, without providing an approved and efficient mechanism to identify and properly classify stream segments that are not capable of providing optimum temperature conditions in the summer.

The Guidance briefly discusses three mechanisms for dealing with these issues, but fails to provide any real guidance on how these mechanisms could be used by the states and tribes. Site-specific numeric criteria are an alternative, but only if the state/tribe can demonstrate that the site-specific criterion fully supports the use. Since EPA is tacitly defining full support as being within the optimum temperature range throughout the year, the likelihood that a site-specific criterion could be demonstrated to provide full support is remote. EPA does not define full support in a way that gives any flexibility regarding numeric temperature criteria or takes into account the actual biological outcomes for salmonids. The Guidance suggests that the states and tribes use "natural background" provisions within the WQS. The Guidance should specify that the "natural background" provision should include an allowance for individual human activities, including existing beneficial uses, and a cumulative limit for all human effects relative to stream segments. The allowance of individual effects and a cumulative effect limit is necessary to protect all the beneficial uses of the surface waters, including agriculture, municipal water supplies and industrial (including hydropower). The Guidance suggests that the TMDL process and a Use Attainability Analysis are the only mechanisms for setting site-specific numeric criteria that are not either entirely due to natural conditions, in the absence of human effects. If that is the case, then EPA should devote a section in

the Guidance to document a detailed and efficient process by which a state or tribe can accomplish these analyses. The Guidance should give the procedures that will be used to determine appropriate, attainable targets for TMDLs and realistic use designations for warm stream segments that have salmonid populations but can't achieve the numeric temperature criteria.

Conclusion

The Guidance is one-dimensional in its consideration of temperature criteria for salmonid populations, with only the optimal range of temperatures considered to provide full support. Although the Guidance attempts to reconcile temperature criteria for naturally warm stream segments with alternative categories of salmonid life-stage uses, the delineation of these alternatives by "furthest downstream extent of use" severely limits the practical application of these alternative uses. The Guidance proposes two additional life-stage criteria; salmon/trout spawning, incubation and emergence and steelhead smoltification, that are unnecessary and impractical to implement. The Guidance fails to provide meaningful assistance to states and tribes where natural conditions or irreversible human effects, including existing beneficial uses, preclude attainment of the optimal temperature range promoted in the numeric criteria. Finally, the Guidance fails to support and protect other beneficial uses of the states and tribes surface waters when requiring numeric temperature criteria that can't be achieved, even in the absence of human effects.

Sincerely,



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December 3, 2002

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Re: *Draft EPA Region 10 Guidance for State and Tribal
Temperature Water Quality Standards*

Dear Mr. Palmer:

The Idaho Power Company (Company) submits comments to the 2nd public review *Draft EPA Region 10 Guidance for State and Tribal Temperature Water Quality Standards (2nd Draft Guidance)* issued by EPA on October 10, 2002. While the 2nd *Draft Guidance* is a significant improvement over the previous 1st draft (October 31, 2001), it remains flawed in one significant respect. Like the 1st draft, the 2nd *Draft Guidance* oversimplifies the complex issue of what numeric water temperatures are necessary to support aquatic life beneficial uses and thereby unreasonably limits states and tribes in the development of numeric criteria that may fully support aquatic life uses under specific circumstances.

While recognizing the broad range of natural variability in water temperatures throughout the region that currently support aquatic life, the 2nd *Draft Guidance* artificially narrows this range by developing temperature criteria based on optimal water temperatures for the various aquatic life stages. This 'one size fits all' approach is inflexible and unrealistic. A numeric temperature standard that is protective of fishes in the northern extreme of their natural range (*i.e.* Alaska) is not necessarily applicable to fishes in the southern extreme (*i.e.* Idaho). In this respect the guidance, and any criteria imposed, should be reflective of the natural range in temperature conditions that exist across the fishes range.

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The 2nd *Draft Guidance* acknowledges that there are ranges of reported “acceptable temperatures” for most life stages. This is consistent with the Clean Water Act. Waters need not meet optimal conditions to be protective of beneficial uses. States and Tribes should be allowed to select the most appropriate numeric criteria from the recognized range based on local meteorological conditions and verified by local reference waters provided such criteria support the designated beneficial uses for the watercourse.

The 2nd *Draft Guidance* artificially limits the flexibility of states and tribes in developing temperature standards that may be responsive to the needs of the aquatic community in specific locations. State and tribal temperature standards cannot be less stringent than federal standards. By using the temperature guidance developed through the 2nd *Draft Guidance* to review and approve, or disapprove, state and tribal water quality standards for temperature, state and tribal temperature standards that do not adhere to EPA’s cookie-cutter approach likely will not survive a subsequent triennial review process.

The Company also takes this opportunity to comment on the “natural background” provisions in the 2nd *Draft Guidance* and the manner in which the concept of natural background has generally been applied in the development of TMDLs in the Region. The 2nd *Draft Guidance* provides that states and tribes may use a natural background narrative temperature criterion if the applicable numeric criteria for a watercourse cannot be met due to natural heating of the water. This is an appropriate concept, but it is often misapplied by either ignoring or under estimating anthropogenic influences on water temperature conditions. Often this results in only the most visible anthropogenic influences, for instance flow alteration associated with hydropower facilities, receiving temperature allocations, while other more generalized influences are considered to part of the natural background. This is inappropriate and may result in a disproportionate and inequitable allocation to the hydropower source.

The 2nd *Draft Guidance* allows states and tribes to provide estimates of anthropogenic influences when developing water quality targets for TMDLs. However, all too often this results in the states or tribes disregarding human impacts that, in the aggregate, significantly influence water temperature. Estimates of anthropogenic influences should be based on the best data available and when not available, efforts should be undertaken to develop the necessary data. In this sense, the 2nd *Draft Guidance* appropriately recognizes that “in estimating natural background conditions the best available temperature modeling techniques should be employed that capture to the greatest extent practicable all the human impacts that influence river temperatures” *Id.*, at 30. This will result in better TMDLs and fairer allocations to individual influences on temperature. EPA should require states and tribes to follow this directive.

By recognizing the need for appropriately applied natural background provisions, and allowing for the development of site-specific criteria and use attainability analysis (UAA), the 2nd *Draft Guidance* is an improvement over the previous draft. However, as

Mr. John Palmer
December 3, 2002
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noted above, establishing arbitrarily restrictive and narrow guidance criteria through the imposition of a one-size fits all approach to temperature criteria will result in overly restrictive standards that do not recognize the on the ground conditions of either specific watercourses or the aquatic uses of those watercourses.

Thank you for the opportunity to comment on the 2nd *Draft Guidance*.

Very truly yours,

A handwritten signature in black ink, appearing to read 'James C. Tucker', with a long horizontal flourish extending to the right.

James C. Tucker

JCT/dkd

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November 26, 2002

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Re: Second Draft of EPA Region 10's Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards (October 10, 2002)

Dear Mr. Palmer:

PacifiCorp is one of the West's largest utilities providing electrical energy to more than 1.5 million residential, commercial, and industrial customers in six Western states including Idaho, Oregon, and Washington. PacifiCorp appreciates the opportunity to submit the following comments on the second draft of EPA Region 10's Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards (Draft Guidance). These comments supplement PacifiCorp's previously submitted comments on the first draft of the guidance.

Overview

The Draft Guidance would primarily affect PacifiCorp's hydroelectric generating facilities. PacifiCorp's has approximately 1100 megawatts of hydro capacity with nearly all in some stage of relicensing by the FERC. Relicensing involves a comprehensive evaluation of the environmental effects of each facility, including any effects on salmonids listed as threatened or endangered under the federal Endangered Species Act. The National Marine Fisheries Service, the U.S. Fish and Wildlife Service, and other relevant federal, state, and tribal agencies with an interest in the protection of salmonids participate extensively in these relicensing proceedings. The result is that new licenses for PacifiCorp's facilities include or will include salmonid protection, mitigation, and enhancement measures that are carefully tailored to address the specific needs of the salmonid populations in the vicinity of each facility.

The Draft Guidance's numeric temperature criteria recommendations, if adopted by states and tribes, would be extremely detrimental to the comprehensive effort to address salmonid population needs that occurs during the relicensing process. This is because the criteria, as water quality standards, would dictate that resources be diverted to achieving extremely cold (and often unobtainable) "optimal" temperatures, regardless whether the reduction in temperature would provide a significant benefit (or any benefit) to salmonid populations, and regardless whether the resources needed to reduce temperature would be better spent on other protection, mitigation, or enhancement measures.¹ In effect, the Draft Guidance would elevate achieving *optimal* temperatures to the highest regional priority.

Temperature standards should protect salmonid populations without painting EPA and other agencies into a regulatory corner if the standards prove to be unnecessary and inappropriate in a specific instance. The Draft Guidance, however, recommends "optimal" temperature criteria that it acknowledges may not be appropriate for many streams, some of which could not meet the criteria even in the absence of human influences. Moreover, the Draft Guidance does not include any practicable mechanism for allowing more appropriate criteria to be applied. What is needed are (1) numeric temperature criteria that provide a floor of temperature protection, rather than year-round optimal temperatures, together with (2) narrative criteria or other mechanisms that provide a practicable means of applying higher or lower criteria as specific circumstances warrant.

"Optimal" Temperature Criteria Are Unnecessary and Inappropriate

Water quality criteria must "protect" designated uses, including salmonid populations. See 40 C.F.R. § 131.11(a)(1). Because of the vulnerability of salmonid populations that have been listed as threatened and endangered, the Draft Guidance assumes that optimal temperatures are necessary to protect the various life stages of these populations.

This assumption is unwarranted. Although the Draft Guidance points to evidence that water temperatures that are higher than optimal may cause certain adverse chronic and sub-lethal effects, it does not show that these temperatures, particularly if they occur for only brief periods, have significant adverse effects on salmonid *populations*. To the contrary, the Draft Guidance concedes that many streams in the Pacific Northwest would naturally be warmer than the recommended criteria. Given this, and given the natural daily, seasonal, and annual fluctuations in stream temperatures, it would be extremely surprising if salmonid populations had evolved to require, throughout their entire life cycle, "optimal" temperatures that are colder than natural stream temperatures.

¹ For example, hydroelectric projects fund offsite mitigation and enhancement measures by generating and selling electrical power. If the operational or other changes needed to lower stream temperatures reduce power generation, there will be less money available to fund these measures, which may in individual cases provide far more benefits to salmonid populations.

Furthermore, because the recommended criteria are expressed as maximum stream temperatures,² rather than as average stream temperatures, the natural fluctuations in stream temperatures will require that streams have temperatures that are much colder than the criteria almost all the time in order to ensure that maximum temperatures do not exceed the criteria. Thus, the average temperature of a stream will likely have to be several degrees below the “optimal” stream temperature even during the summer. Put another way, streams that complied with substantially higher maximum temperature criteria than those that the Draft Guidance recommends would be at or near the optimal temperature nearly all the time. Again, it is implausible that salmonid populations would have evolved to require stream temperatures that never exceed the recommended optimal criteria.

EPA’s obligation under the Clean Water Act is to identify the stream temperatures that are actually necessary to protect salmonid populations and other designated uses. By recommending optimal, rather than protective, temperature criteria, the Draft Guidance has abandoned any effort to meet this obligation. Moreover, the effort to reduce maximum stream temperatures from protective levels to optimal levels, even where it is possible or feasible, would likely provide few or no benefits to salmonid populations at a cost that could be devastating to the economy of the Pacific Northwest, as well as to funding for habitat restoration and other measures that may be much more beneficial to these populations.

PacifiCorp therefore urges EPA to reconsider the Draft Guidance’s recommended “optimal” temperature criteria and replace them with criteria that are set at the temperatures consistent with the **protection** of listed salmonid populations. The criteria should include a reasonable margin of safety to account for uncertainty regarding the effects of temperature on salmonid populations, but the Draft Guidance has not made a persuasive case that “optimal” temperatures are essential to the protection and recovery of these populations.

The Recommended Temperature Standards Should Include Provisions That Allow More Appropriate Criteria to Be Applied in Specific Circumstances

² More precisely, the criteria are expressed as the seven-day average of daily maximum temperatures.

As EPA is aware, it is difficult to establish an appropriate water quality criterion even for a pollutant that is not naturally present in a stream. It is virtually impossible to establish an appropriate criterion for heat, which is naturally present in streams, which is essential to salmonids and other aquatic life in varying amounts, and which fluctuates substantially from hour-to-hour, day-to-day, season-to-season, and year-to-year. Therefore it is important to accompany any regional temperature criteria recommendations with practicable mechanisms for adjusting the criteria to specific streams as local conditions warrant. Such mechanisms are all the more important if the recommended regional criteria are likely to be inappropriate for a large number of streams, as are the Draft Guidance's recommended criteria, which are based on "optimal" temperatures.

The Draft Guidance identifies three existing mechanisms for addressing circumstances in which the recommended criteria are inappropriate: (1) use of a narrative criterion that provides that the natural background temperature is the applicable criterion if that temperature exceeds the numeric criterion; (2) adoption of a site-specific criterion that protects salmonid populations and other designated uses; and (3) adoption of a site-specific criterion that supports a marginal or limited use based on a use attainability analysis. None of these mechanisms, however, provide a practicable means of allowing anthropogenic warming if the numeric criteria are inappropriately stringent. Setting the criterion at a higher, natural temperature does not allow any anthropogenic warming. And site-specific criteria are resource-intensive efforts that require an amendment of the state or tribe's water quality standards, which in turn requires EPA approval and possible consultation under section 7 of the Endangered Species Act. These are not practicable means for addressing inappropriate numeric criteria for any significant number of streams. Indeed, PacifiCorp's experience is that the states have few resources to devote to site-specific criteria even in the context of hydroelectric relicensing proceedings, in which there is generally a wealth of data concerning water quality and salmonid populations.

In order to be practicable, mechanisms for addressing inappropriate numeric criteria must be incorporated into the state's or tribe's water quality standards. Two important mechanisms that are included in the currently approved temperature standards of one or more Northwest states are the concept of "non-measurable" temperature effects and long-term temperature management plans. The provision for "non-measurable" effects allows insignificant anthropogenic warming (*e.g.*, 0.3° C.) even when the stream exceeds the numeric criterion. This is appropriate because insignificant warming by definition does not pose a threat to salmonid populations.

Provisions for long-term temperature management plans also enable the state or tribe to require feasible reductions in existing thermal loads, without causing the source to be out of compliance with water quality standards if the numeric criteria cannot feasibly be met. Temperature management plans protect salmonids and other designated uses by ensuring relatively rapid and continual reductions in existing thermal loads. They also provide a mechanism for addressing numeric temperature criteria that are inappropriate for a specific stream.

The Draft Guidance does not discuss these or other practicable mechanisms for applying numeric criteria to specific waters. Again, given the extreme stringency of the recommended numeric criteria, such mechanisms are critical to enabling states and tribes to address the many circumstances that are likely to arise in which application of the criteria will be unnecessary and inappropriate.

Summary

PacifiCorp agrees that temperature is a critical water quality parameter for salmonids. Temperature criteria, however, should be set at temperatures that are necessary to protect salmonid populations, not at unrealistic and unachievable “optimal” temperatures. Moreover, because of the substantial geographic and temporal variability in stream temperatures, as well as the variability in the temperature needs of different salmonid populations and life stages, temperature standards must include practicable mechanisms for addressing circumstances in which regional numeric temperature criteria are inappropriate. Otherwise, the adoption and application of the recommended numeric temperature criteria may provide little or no marginal benefit to salmonid populations at a very great cost to the Pacific Northwest and to other efforts to restore these populations.

Thank you for again considering PacifiCorp’s comments. PacifiCorp looks forward to continuing to work with EPA and other federal and state agencies on this issue.

Sincerely,

Terry Flores
Director
Hydroelectric Relicensing

cc: Mr. Mark Charles, Oregon Department of Environmental Quality
Mr. Don Essig, Idaho Department of Environmental Quality
Mr. Mark Hicks, Washington Department of Ecology